

PCBs Concrete and Soil Sampling Cleanup Verification Work Plan and Sampling and Analytical Plan

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

January 15, 2016
UW Project No. 204350
Terracon Project No. BA158014

Prepared for:
University of Washington
Seattle, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

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Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

January 15, 2015



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Attn: Mr. Shane Ruegamer

Re: PCBs Concrete and Soil Sampling Cleanup Verification Work Plan and Sampling and Analytical Plan

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington
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Terracon Consultants, Inc. is pleased to submit this Cleanup Verification Work Plan and Sampling and Analytical Plan for the Polychlorinated Biphenyls (PCBs) Concrete and Soil Sampling activities proposed within the basement level transformer room portions of the north, south, and central towers of McCarty Hall at the above referenced site.

We appreciate the opportunity to perform these services for the University of Washington. Please contact the undersigned if you have questions regarding the information provided in the work plan and sampling and analysis plan.

Sincerely,
Terracon Consultants, Inc.

A blue ink signature of Chad Kean, consisting of a stylized, cursive "C" followed by a horizontal line.

Chad Kean, CIH, CHMM, CPSWQ
Project Manager II

A blue ink signature of Michael D. Noll, featuring a stylized "M" and "D" followed by a horizontal line.

Michael D. Noll, LG, LHG
Senior Project Manager



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APPENDICES

Appendix A

- Exhibit 1 Site Location Map
- Exhibit 2 PCB Cleanup Verification Sampling Plan

Appendix B

Terracon - PCBs Concrete and Soil Sampling Investigation Report - January 12, 2016

Appendix C

Terracon – PCB Soil and Concrete Remediation Specification, Section 02 84 50, Addendum 3 - December 10, 2015

1.0 Introduction

On behalf of the University of Washington, Terracon Consultants, Inc. (Terracon) has prepared this Polychlorinated Biphenyls (PCBs) Cleanup Verification Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan (SAP), to be implemented during the removal of concrete and/or soil containing PCBs above regulatory levels at the site.

1.1 Site Vicinity Description

The site is located in the North portion of the University of Washington (UW) campus. McCarty Hall is comprised of a north, south and central tower. The site is bounded to the north by Northeast 45th Street and to the east, south, and west by additional University of Washington facilities. The location of the site is illustrated in Exhibit 1.

1.2 Summary of Previous Work

Dames & Moore completed a Closure Report PCB Remediation at the site in June 1997. As part of an initial investigation, site characterization was conducted in the transformer rooms between November 1994 and March 1995 to determine the nature and extent of PCB contaminated material resulting from transformer oil leaks or spills. The results of the site characterization indicated that PCBs were present in all three transformer rooms at McCarty Hall at concentrations exceeding regulatory action levels under the Toxics Substance Control Act (TSCA). Please refer to the Dames & Moore report included as part of Appendix B for further information regarding the 1994-1995 site characterization and remedial activities.

Dames & Moore conducted remedial activities in the north, south, and central tower transformer rooms in McCarty Hall between July and December 1996. Remedial activities included removal, disposal and/or replacement of the transformers and electrical appurtenances containing PCBs; washing and rinsing of PCB contaminated concrete surfaces; scabbling and encapsulating of the washed PCB contaminated concrete surfaces; removal of selected PCB contaminated concrete slabs and underlying soils; confirmatory sampling and analysis during and following removal or decontamination activities; and waste disposal.

In the north tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of selected concrete slabs and underlying soils. During the initial investigation, five core samples were collected from the concrete floor. One core sample contained 390 milligrams per kilogram (mg/kg, approximately equivalent to parts per million [ppm]) of PCBs. The concrete floor slabs located in the northeast corner and south-central portion of the electrical room were removed and replaced. Following the concrete floor slab removal, one soil sample collected at

approximately seven inches below ground surface (bgs) contained 1.6 ppm PCBs. A total of four wipe sample were collected prior to the slab removal and, based on the wipe sample results (PCBs concentrations ranged from 7 to 470 micrograms per 100 square centimeters [$\mu\text{g}/100\text{cm}^2$]), portions of the floor slab were either removed or encapsulated. In addition, in the non-encapsulated areas, the floors were washed and rinsed and an additional four wipe samples were collected. Based on the results of the final wipe samples (the results ranged from less than 1 $\mu\text{g}/100\text{ cm}^2$ to 35 $\mu\text{g}/100\text{ cm}^2$), no further remedial action was completed in those areas.

In the south tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, and encapsulation using an epoxy-based paint. A total of 12 post-cleanup surface wipe samples were collected from the concrete floor surface, with results ranging from less than 1 $\mu\text{g}/100\text{ cm}^2$ to 35 $\mu\text{g}/100\text{ cm}^2$. Based on the wipe sample results, the surfaces were then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan and red from the top to bottom.

In the central transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slabs and underlying soils. During the initial investigation, seven concrete cores and six sub-slab pea gravel samples were collected at depths ranging up to 2.4 feet bgs. Two concrete core samples and two pea gravel samples contained PCBs at concentrations above 10 ppm, the EPA-specified cleanup level for PCBs-impacted material left in place at the site. The concrete floor in the east portion of the electrical room was removed and replaced, along with the underlying pea gravel, to depths up to approximately 3.2 feet bgs. In the western portion of the room, the floor was scabbled. Based on the results of three post-scabbling wipe samples (all less than 10 $\mu\text{g}/100\text{ cm}^2$), no further remedial action was completed on the electrical room floor. In addition, the eastern half of the north wall of the electrical room was washed and rinsed. Two final wipe samples were collected from the electrical room wall. Based on the results (both less than 10 $\mu\text{g}/100\text{ cm}^2$), no further remedial action was completed on the electrical room wall.

In the hallway areas outside of the Central tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of a portion of the concrete slab. Based on the results of the initial investigation and follow-up sampling, portions of the surrounding hallway were washed and rinsed, encapsulated, or removed. In addition, the concrete slab in the doorway of the fan room was removed and replaced, and the remainder of the impacted hallway concrete floor area was encapsulated.

Terracon completed additional sampling activities and prepared the following documents:

**PCBs Concrete and Soil Sampling Cleanup Verification Work Plan
and Sampling and Analytical Plan**

North Campus Student Housing - McCarty Hall ■ Seattle, Washington
January 15, 2016 ■ Terracon Project No. BA158014



- PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan dated October 7, 2015
- PCB Soil and Concrete Remediation Specification, Section 02 84 50, Addendum 3, dated December 10, 2015
- PCBs Concrete and Soil Sampling Investigation Report dated January 12, 2016,

Based on the work conducted by Terracon, PCBs were identified in portions of the concrete slabs and walls in the North, South and Central towers at concentrations equal to or exceeding 2 ppm, but less than 50 ppm. PCBs were detected in the pea gravel fill material immediately underlying the concrete slabs at depths of 0.5 feet bgs in the North and Central towers at concentrations equal to or exceeding 2 ppm, but less than 50 ppm.

Based on the sample results, portions of the concrete floor slabs and/or concrete masonry walls in the North, South, and Central tower transformer rooms, as well as a portion of the shallow pea gravel beneath the concrete floor in the North and Central tower transformer room areas, contain PCBs at concentrations exceeding 2 ppm, and will therefore require proper disposal as "State Special Waste" per WAC 173-303. Please refer to the PCB Soil and Concrete Remediation Specification, Section 02 84 50, Addendum 3, dated December 10, 2015, which is included as Appendix C, for further information regarding handling and disposal.

1.3 Standard of Care

Terracon's services will be performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of this work plan and sampling and analysis plan, or in any subsequent reports. Our services will be performed in accordance with the scope of work agreed to by our client, as reflected in our executed task order, and are not restricted by ASTM E1903-11.

Findings, conclusions and recommendations resulting from our services are based upon information derived from the on-site activities and other services performed under our scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this investigation. Subsurface conditions may vary from those encountered at specific borings or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations,

findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for contaminants in connection with a property. Completion of the activities proposed in this work plan and sampling and analysis plan is intended to reduce, but not eliminate, uncertainty regarding the existence of contaminants in connection with the subject property.

1.4 Reliance

This cleanup verification work plan and SAP are certified to, can be relied upon by, and has been prepared for the exclusive use of the University of Washington and regulatory agencies having jurisdiction over the site. Reliance on this work plan, SAP, and any subsequent reports by the client and all authorized parties will be subject to the terms, conditions and limitations stated in our proposals, reports, and Argus Pacific's Master Agreement for Regulated Building Materials and Engineer Services with the University of Washington.

2.0 Investigation Objectives

The overall objectives of the PCBs Concrete and Soil Sampling Cleanup Verification Work Plan and Sampling and Analysis Plan at McCarty Hall are outlined in the following sections.

2.1 Project Objectives

The primary objective of this plan is to verifying that the PCB remediation work is conducted in compliance with 40 CFR Part 761 Subpart O and the UW specification attached as Appendix C. Terracon will observe all aspects of the planned remediation work and will, on behalf of the UW, perform site cleanup verification sampling in compliance with 40 CFR Part 761 Subpart O. The attached Exhibit 2 shows the remediation areas with proposed cleanup verification sampling points for both concrete and soil.

2.2 Data Quality Objectives

The overall QA/QC objectives of this work plan and SAP are to outline procedures for the collection and assessment of data that are within acceptable ranges of precision, accuracy, representativeness, completeness, and comparability (PARCC) to meet the project Data Quality Objectives (DQOs). The DQOs associated with environmental data are a function of the sampling rationale and the procedures used to collect the samples, as well as the analytical methods and instrumentation used. However, uncertainty cannot be eliminated entirely from environmental data.

Details regarding the sampling rationale, procedures, and analytical methods are provided in Sections 4.0 through 5.0 of this work plan and SAP. Information with respect to field and laboratory quality assurance and quality control checks is provided in Sections 6.0 and 7.0.

The DQOs for this investigation will be used to provide environmental data of sufficient quantity and quality to support an evaluation of the successful removal of regulated materials impacted with historical PCBs releases to the concrete floor and underlying pea gravel fill associated with the electrical transformers and appurtenances located in the basement areas of the North, South, and Central towers.

2.3 Regulatory Standards/Guidelines

PCBs and PCB-contaminated materials are regulated by the EPA under TSCA (40 CFR Part 761), as well as by the Washington State Department of Ecology under the Model Toxics Control Act (MTCA) and Dangerous Waste Regulations. Based on the previous work conducted at the site by Terracon and others, which were conducted under TSCA and reviewed by EPA Region X, it has been determined that the proposed PCBs-contaminated materials removal and confirmation sampling work will also be conducted under TSCA, and that this work plan and SAP and any subsequent reports will be submitted to EPA Region X for review and comment.

3.0 Physical Setting

Brief descriptions of regional and local topographic and hydrogeologic settings associated with the site are presented in this section.

3.1 Site Geology and Hydrogeology

Soil types documented at the site during Terracon's 2015 site characterization work and Dames & Moore's sub slab investigation (Dames & Moore / Closure Report PCB Remediation 1997) consisted of pea gravel (probable slab underlayment) to the maximum depth explored (4 feet bgs). No indications of groundwater were observed during the investigations. Please see Appendix B for further information regarding the regional and local geology and hydrogeology.

4.0 Concrete and Soil Sampling Strategy and Rationale

Described in this section are the sampling strategies that will be employed to meet the project and data quality objectives stated above, as well as the rationale behind the selection of sample locations and analytical methods.

Terracon proposes to collect 11 full-depth samples from the concrete floor slabs and nine full-depth samples from the concrete walls in the North and South tower transformer rooms following completion of the PCBs-impacted concrete removal work. Soil sampling following completion of the PCBs-impacted soil removal work in the North and Central tower transformer rooms will be conducted by utilizing a stainless steel shovel to collect samples of the pea gravel fill/soils and will include collecting 21 discrete samples, 13 from the North tower and 8 from the Central tower.

4.1 Concrete Sampling

Concrete samples will be collected utilizing a rotary hammer and bit to produce pulverized samples of the concrete. One discrete full-depth sample from each location shown in Exhibit 2 will be collected for laboratory analysis. Due to the size of the PCBs-impacted concrete slab area in the North tower each one of the three samples collected from the South, West and East sides will be analyzed as a discrete sample. In the South tower two discrete samples will be collected from each side of the impacted concrete slab area, and will subsequently be composited into one sample per “edge” (i.e., North, South, East and West). Concrete wall cleanup verification sampling in each tower will consist of collecting one discrete sample from the horizontal extent (i.e., East and West) of the wall removal and one discrete sample above the vertical extent of the wall removal, for a total of three samples per tower.

Concrete samples requiring compositing will be composited per 40 CFR 761.289, and either mixed in the field or at Terracon’s Mountlake Terrace office. Concrete samples will be submitted to ALS Analytical Group (ALS) in Everett, Washington, for PCBs analysis by EPA Method 8082, in accordance with the procedures outlined in Section 6.0 below.

The results of these analyses will be used to assess the completion of the PCBs-impacted materials removal work and to determine if additional concrete slab or wall materials need to be removed and disposed as State Special Waste.

4.2 Soil Sampling

Following excavation and removal of the PCBs-impacted soil areas shown in the Central and North towers on Exhibit 2, discrete soil samples will be collected for laboratory analysis from the excavation bottom and sidewalls using a clean stainless steel hand shovel. In the North tower, two discrete samples will be collected from the East and West sidewall of the excavation, and three from the North and South sidewall and the excavation bottom to be composited into one sample per sidewall (e.g. North, South, East and West) and pit bottom. Due to the size of the PCBs-impacted soil area in the Central tower, one discrete soil sample will be collected from the East and West sidewall and submitted along with two discrete

samples from the North and South sidewall and pit bottom of the impacted area to be composited into one sample per sidewall and pit bottom.

Soil samples requiring compositing will be composited per 40 CFR 761.289, and either mixed in the field or at Terracon's Mountlake Terrace office. Soil samples will be submitted to ALS for PCBs analysis by EPA Method 8082, in accordance with the procedures outlined in Section 6.0 below.

The results of these analyses will be used to assess the completion of the PCBs-impacted soil removal work, and to determine whether additional soil needs to be removed and disposed as State Special Waste.

5.0 Field Methods and Sampling Procedures

The following section provides detailed information regarding the methods and procedures that will be used to conduct the additional site characterization.

5.1 Pre-mobilization Activities

Prior to conducting intrusive activities, several critical tasks will be performed to ensure compliance with applicable regulatory requirements and to minimize the potential risk associated with rotary hammer operations and subsurface sampling.

EPA Review – This work plan and SAP will be submitted to EPA Region X for review and approval.

Underground Utility Clearance – The general contractor selected by the UW for the project, W. G. Clark Construction Company (WG Clark) of Seattle, Washington and their subcontractor conducting the concrete and soil removal work will be responsible for all utility locating and clearances. Terracon will confirm that the utility clearances have been completed by the contractor prior to collecting concrete or soil samples.

5.2 Pre-Construction Meeting

Terracon will schedule an on-site pre-construction meeting with the University of Washington and WG Clark and their subcontractor to discuss the proposed PCB-s-impacted materials removal activities and subsequent cleanup verification sampling procedures.

5.3 Health and Safety

A site-specific Health and Safety Plan (HASP) has been prepared for this investigation and will be implemented by all field personnel and project management. All field personnel are

required to read and understand the HASP prior to the initiation of work. In addition, a daily tailgate safety meeting will be conducted by the Terracon site safety officer prior to the start of field activities.

5.4 Sampling Activities

Based on the surface and subsurface conditions and fill/soil types present at the site, it is anticipated that the all concrete drilling and sampling activities will be conducted using a rotary hammer and bit, and that all soil samples will be collected using a clean stainless steel shovel.

Concrete Sampling – Concrete samples will be collected using a rotary hammer and bit to produce pulverized samples of the concrete. Bit size will vary by location but will be between 1-4 inches in diameter. The drill bit will be placed within a dust collection shroud to control fugitive dust. In addition, a High Efficiency Particulate Air (HEPA) filter equipped air scrubber will also be placed adjacent to the sample location to help control fugitive dust. Concrete samples will be collected into 4-oz glass jars using clean stainless steel scoops.

Soil Sampling – Pea gravel fill/soil samples will be collected from excavation sidewalls and bottoms using a clean stainless steel shovel. Soil samples will be collected into 4-oz glass jars using clean stainless steel scoops.

5.5 Decontamination Procedures

Decontamination of non-disposable sampling equipment will be performed prior to sampling and in between sample locations to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. All non-disposable sampling equipment utilized will be decontaminated by washing with a non-phosphate detergent, such as Liquinox™, Alconox, or equivalent, followed by a distilled water rinse. Decontamination water will be collected in drums onsite.

5.6 Sample Handling Procedures

The following subsections provide details regarding the sample handling procedures that will be followed for this investigation. These include sample labeling, packaging, and shipping procedures.

Compositing - Samples requiring compositing will be composited per 40 CFR 761.289, and either mixed in the field or at Terracon's Mountlake Terrace office.

Labeling - Sample labels are necessary to prevent misidentification of samples. Sample labels will be filled out in indelible black or blue ink and affixed to sample containers at the

time of sample collection. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection
- Sampler's initials
- Analyses required

Packaging and Shipping - Immediately after sample labeling, sample containers will be bagged in a resealable plastic bag to protect the samples from moisture and to prevent breakage and potential cross-contamination during transportation to the laboratory. All glass sample containers will be protected with bubble wrap if transported by a commercial carrier. The temperature of the samples will be recorded by the laboratory on the Chain of Custody (COC) record immediately upon receipt of the samples.

Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage. Samples transported by a laboratory-assigned courier will be packed in a sample cooler with sufficient ice to keep the samples cooled.

5.7 Sample Documentation

The following subsections provide details regarding the sample documentation procedures that will be followed for this investigation. These include preparation of Chain of Custody Forms and documentation of field notes.

Chain of Custody (COC) - To establish the documentation necessary to trace sample possession from the time of collection through analysis and disposal, a COC record will be completely filled out and will accompany every sample. Samples will be delivered to the laboratory for analysis as soon as practical. A COC record will accompany all samples. At a minimum, the following items will be recorded on the COC record:

- Project name
- Project location/Site ID
- Project number
- Sample ID
- Sampler name
- Date (of sample collection)
- Time (of sample collection to the nearest minute, 24-hour clock)
- Sample type (matrix)
- Number of sample containers
- Analyses required
- Comments

- Observations specific to sample
- The sampler will be the first person to relinquish sample possession
- Courier/laboratory representative signature
- Date/time (of custody transfer)

Field Logbooks/Notebooks - In order to maintain the integrity and traceability of samples, all information pertinent to field sampling will be recorded in a field logbook or field notebook. All samples will be properly labeled and packaged prior to being transported to the laboratory and will be accompanied by completed COC documentation. All documentation will be recorded in the field logbook or notebook in indelible black or blue ink.

At the end of each workday, the logbook/notebook pages will be signed by the responsible sampler and any unused portions of the logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the logbook will contain the following information:

- Project name and site location
- Date and time
- Personnel in attendance
- General information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Descriptions of deviations from this work plan and sampling and analysis plan
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the samples

5.8 Investigation Derived Waste

One 16-gallon drum of investigation-derived waste (IDW) will be stored at the site for this project. Decontamination water will be generated during the sampling activities performed during this investigation and will be placed in the 16-gallon water drum stored on site

The drum will be clearly labeled with the following information:

- Contact information for Terracon Consultants
- Date (day that accumulation of drum contents was initiated)

- Media type (concrete/soil spoils, decontamination water)
- Disposition (non-hazardous, pending analysis)

The IDW drum will be sampled for PCBs analysis by EPA Method 8082 following completion of cleanup verification activities to determine regulatory status. If required based on the analytical results, the drum will be disposed of in conjunction with the PCBs-impacted concrete and soil.

6.0 Analytical Strategy

This section outlines the analytical methods, sample containers, preservative requirements, and field quality control (QC) samples for this investigation.

6.1 Analytical Methods

The following analytical methods will be used to analyze concrete, soil and decontamination water samples for this project:

- PCBs analysis by EPA Method 8082.

Detailed information on methods and calibration criteria is provided in Section 7.0.

6.2 Sample Containers, Preservatives, and Holding Times

Concrete, soil and decontamination water samples will be placed in clean glassware provided by the laboratory. Each soil sample will comprise of one 4-ounce clear glass jar. Each decontamination water sample will comprise one 1-liter amber bottle without preservative. Hold times for PCBs analysis of concrete/soil and water are 7 days to extract and then 40 days to analyze.

6.3 Field Quality Control Samples

Field QC samples will be collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples for this project will consist of one concrete sample duplicate and a single equipment blank. Field QC samples will be analyzed for PCBs using EPA Method 8082.

The field duplicate will consist of two distinct concrete samples (an original and a duplicate) from the same sample location collected at the same time to the extent practical and using the same sampling techniques. The field duplicate data will be used to evaluate the precision of the overall sample collection and analysis processes. Due to the heterogeneous nature of the soil matrix, field duplicate samples of soil will not be collected.

Field duplicates are uniquely identified so that the identity of the field duplicates is "blind" to the analytical laboratory. Locations of field duplicate samples and their identifications will be recorded in the field notes.

The equipment blank will be prepared by pouring a sample of deionized water over or through decontaminated field sampling equipment prior to the collection of environmental samples. The equipment blank will be stored with the other samples and analyzed by the laboratory for PCBs by the same method used for the other samples.

Equipment blanks are used to assess the adequacy of the decontamination process. They assess contamination from the total sampling, sample preparation and measurement process, when decontaminated sampling equipment is used to collect samples. Equipment blanks must be prepared using the same type of containers as the field samples.

7.0 Analytical Quality Control Procedures

This section describes laboratory qualification, sample custody and documentation, QC procedures, QC samples, preventative maintenance, data review, and deliverables for the collection of samples for chemical analysis.

7.1 Qualifications of Analytical Laboratory

The analytical laboratory selected to analyze samples for this project will be certified by the Washington State Department of Ecology and through the National Environmental Laboratory Accreditation Program (NELAP) for all of the analytical methods required for the project. The selected laboratory for the project will be capable of providing the required turnaround times, project QC, and data deliverables required by this work plan and sampling and analysis plan.

7.2 Laboratory Quality Control Procedures

The analytical laboratory must have written standard operating procedures (SOPs) defining the instrumentation, instrumentation maintenance, tuning, calibration, method detection and RLs, QC requirements, blank requirements, and step-by-step procedures for each analytical method. The SOPs must be available to the analysts performing the work. The SOPs must meet or exceed the requirements of the analytical methods cited in this work plan and sampling and analysis plan. The laboratory must maintain logs of all activities that have an impact on the quality of the laboratory results.

Any portion of the method that is subcontracted by the laboratory to another laboratory or sent to another facility of the same network of laboratories must have the prior approval of the Terracon Project Manager.

The laboratory must maintain the instruments in working condition required by the methods specified for the analyses. Sufficient redundancy in equipment must be available in the laboratory to handle downtime situations. Method substitution because of instrumental failure will not be permitted without written approval from the Terracon Project Manager.

7.3 Laboratory Quality Control Samples

The following subsections outline the laboratory QC samples required by this project.

Calibration - All instruments and equipment must be calibrated in accordance with the specified methods, unless different instructions are included in this document. Each instrument must be calibrated with the standard solutions appropriate to the type of instrument and the calibration range established for the method.

Initial calibrations (ICALs) should be performed when the method is first used and again whenever the continuing calibrations fail to meet their respective acceptance criteria. In addition, if the instrument undergoes significant maintenance, the ICAL must be repeated. Continuing calibrations verify that the instrument performance has remained within the limits set at the time of the ICAL. The frequency of continuing calibrations is specified in referenced methods.

Instrument/Calibration Blanks - Instrument blanks are run to ensure that analytes from previous runs have been purged out of the system and do not contaminate succeeding runs. Instrument blanks must be run following calibration runs, before sample analyses are performed, and after samples containing high concentrations of potentially interfering materials are found.

Target analytes must not appear in the instrument blanks at concentrations greater than half the required RLs. If the laboratory consistently observes contaminants in the instrument blanks, the laboratory must investigate the source of the contamination and eliminate it, if possible.

Method Blanks (MB) - Method blanks are prepared in the same manner as the samples, using the same reagents and glassware as for samples. The purpose of the method blank is to ensure that the equipment and reagents used in preparing the samples are free of contaminants that could interfere with the analysis. The method blank must be prepared and analyzed for each batch of 20 project samples or less per matrix (aqueous and solid) type.

The method blank must not exhibit analytes at concentrations greater than half the required RLs. If contaminants are found that either contribute to the apparent concentration of a particular target analyte or interfere with the analysis, the analysis must be stopped, the source of contamination identified and corrected, and the analysis repeated. Contamination

in the method blank above half the RLs will require that the entire associated batch of extracts or digestates be reprepared and reanalyzed. Hence, it is very important to make sure that no such contamination is present.

Laboratory Control Samples (LCS) - LCSs are pre-prepared and checked samples containing known concentrations of specific target analytes. LCSs can also be prepared by spiking known amounts of target analytes into a well-characterized blank matrix. The matrix must be analyte-free, laboratory reagent-grade water for water samples and clean sand or equivalent for soil samples.

The LCS is prepared and run at a frequency of one per 20 project samples per matrix with the associated samples, using the same reagents and volumes. If insufficient quantity of sample is available for MS/MSD, the LCS will be prepared and analyzed in duplicates (LCSD). All analytes in the LCS must meet recovery criteria. If the criteria are not met, the entire batch of samples must be reprepared, together with a new LCS, and reanalyzed.

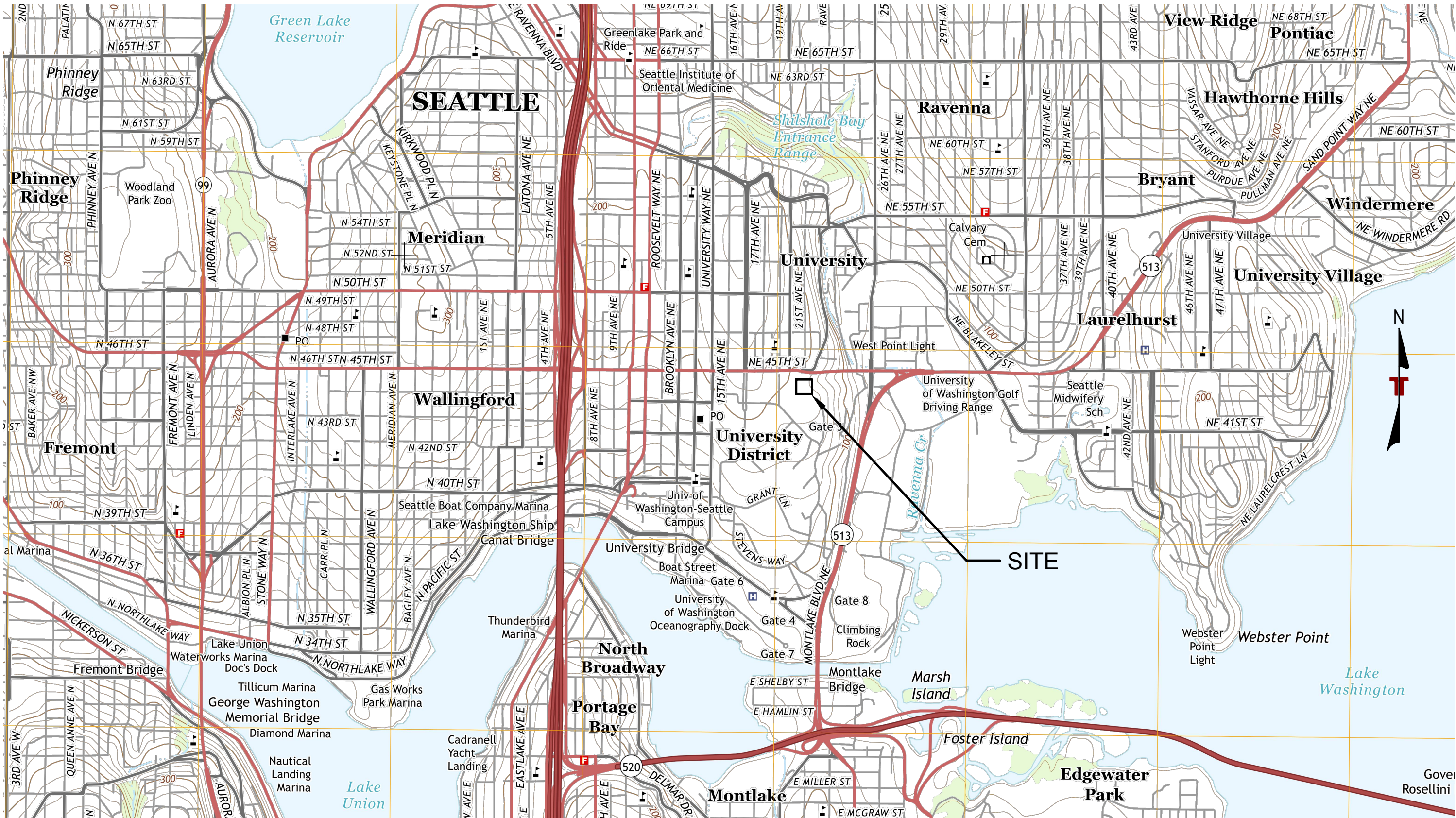
Matrix Spike and Matrix Spike Duplicate (MS/MSD) - The MS/MSD serves to determine whether matrix effects are affecting recoveries. For inorganic analyses, only a single MS is performed per batch. A MS/MSD is prepared by spiking a known amount of solution to two portions of a sample being run in a batch. Once the spike is added to the MS/MSD samples, these samples are carried through the complete sample preparation process along with the other samples in the batch. The MS/MSD recoveries are compared against each other and against the known amount of the spike.

From this data, both accuracy and precision can be determined. The laboratory will perform a MS/MSD at a frequency of one per 20 project samples per matrix. To prepare a project-specific MS/MSD, field personnel will collect additional sample volumes at a frequency of one per 20 samples. Field personnel will designate samples for MS/MSD analysis on the COC record.

APPENDIX A

Exhibit 1: Site Location Map

Exhibit 2: PCB Cleanup Verification Sample Plan



LEGEND: Base map derived from U.S. Geological Survey 7.5 Minute Series Washington King Co. Seattle North Quadrangle 2014 and modified Terracon.

 APPROXIMATE SITE LOCATION

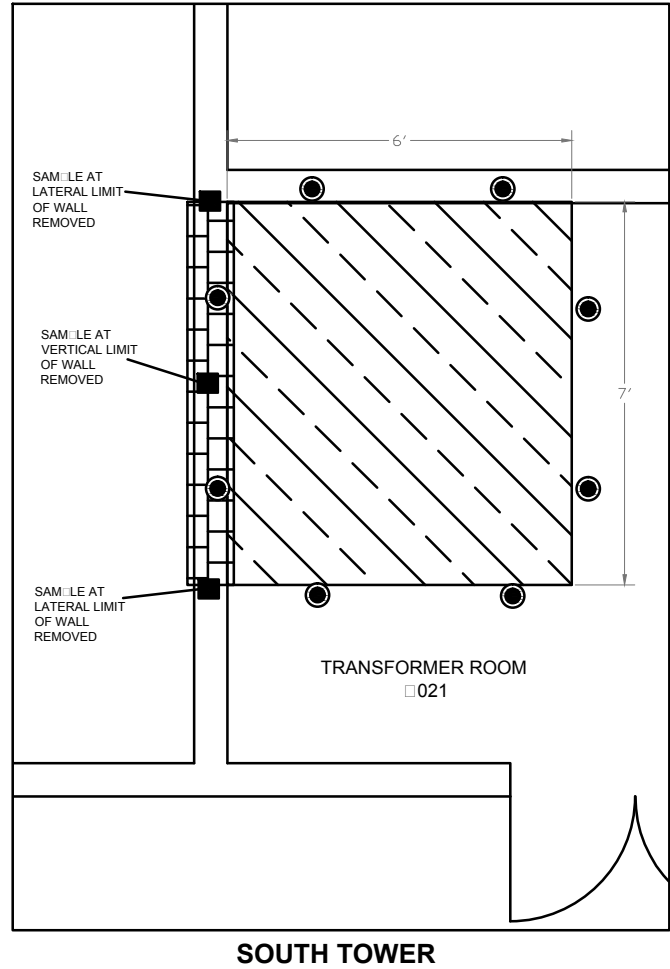
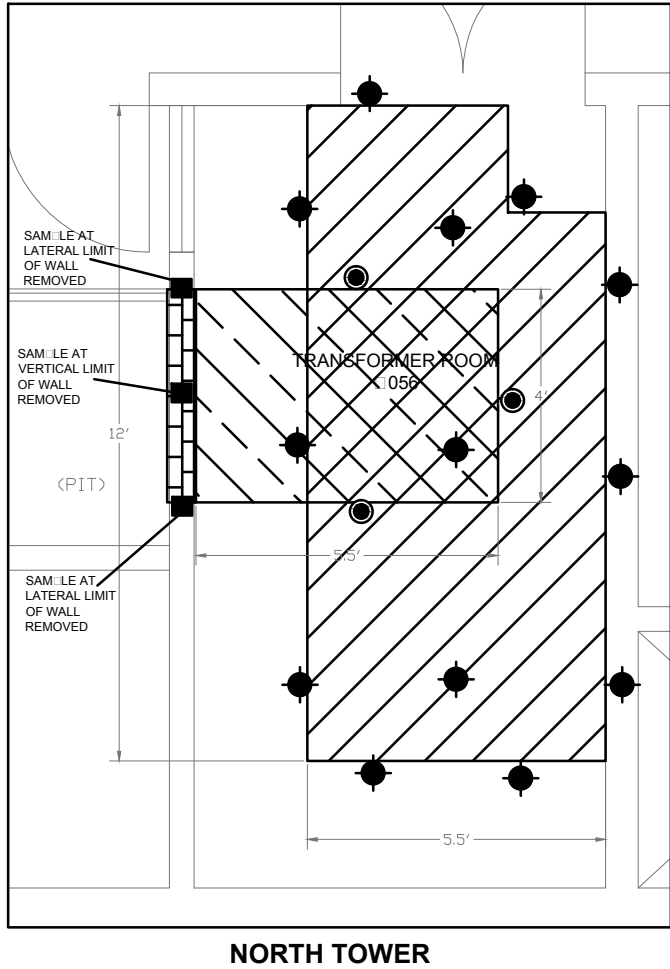
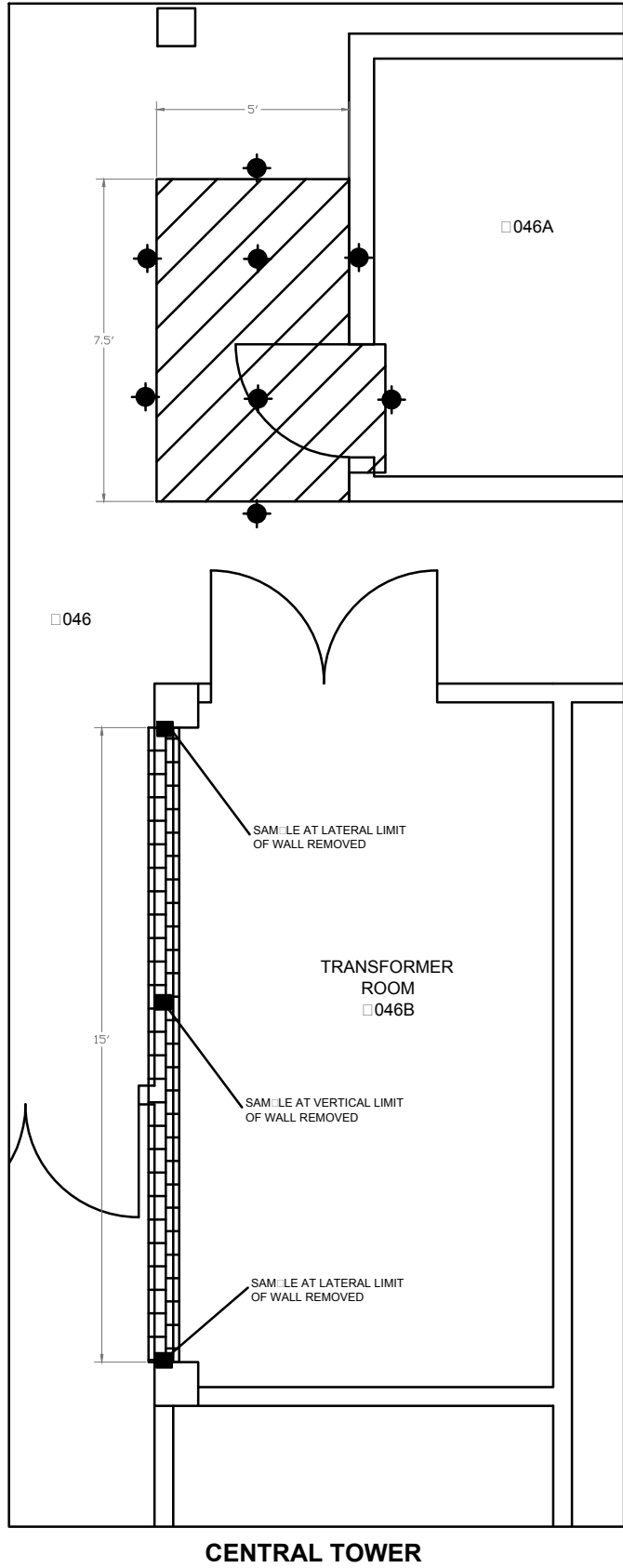
Project Mgr:	CDK
Drawn By:	AAS
Checked By:	CDK
Approved By:	MDN

Project No.	BA158014
Scale:	NOT TO SCALE
File No.	*.dwg
Date:	January 2016

Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

Site Location Map
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

EXHIBIT
1



LEGEND:

- REMOVE SOIL ONLY TO 24 INCHES BELOW SLAB
- REMOVE CONCRETE SLAB ONLY
- REMOVE LOWER 12 INCHES OF CMU WALL BLOCK ONLY

- APPROXIMATE SOIL CLEANUP VERIFICATION SAMPLE LOCATION
- APPROXIMATE CONCRETE CLEANUP VERIFICATION SAMPLE LOCATION
- APPROXIMATE CONCRETE OR CMU BLOCK WALL CLEANUP VERIFICATION SAMPLE LOCATION

NOTES:

- PCB CONTAMINATION HAS BEEN IDENTIFIED IN THE AREAS OF WORK RESULTING FROM TRANSFORMER OIL SPILLS WHICH WERE CHARACTERIZED BY DAMES AND MOORE IN THE 1990's. SUBSEQUENTLY AN INTERIM SITE CLEANUP WAS PERFORMED, CONSISTING OF REMOVAL OF CONCRETE, REMOVAL OF SOIL, SURFACE CLEANING, SCARIFICATION OF THE UPPER SURFACE OF CONCRETE AND ENCAUSULATION. REMAINING PCB CONTAMINATED CONCRETE AND SOIL REQUIRE REMOVAL TO FACILITATE DEMOLITION OF THE EXISTING BUILDINGS.
- SOIL CLEANUP VERIFICATION SAMPLING IN THE CENTRAL TOWER WILL CONSIST OF COLLECTION AND ANALYSIS OF A TOTAL OF FIVE (5) COMPOSITE SOIL SAMPLES CONSISTING OF THE FOLLOWING DISTRIBUTION OF EIGHT (8) SEPARATE DISCRETE SAMPLES:

SAMPLES	NO. OF DISCRETE SAMPLES
1 EXCAVATION FLOOR	2 DISCRETE SAMPLES
2 NORTH SIDEWALL	2 DISCRETE SAMPLES
3 SOUTH SIDEWALL	2 DISCRETE SAMPLES
4 EAST SIDEWALL	1 DISCRETE SAMPLE
5 WEST SIDEWALL	1 DISCRETE SAMPLE
- SOIL CLEANUP VERIFICATION SAMPLING IN THE NORTH TOWER WILL CONSIST OF COLLECTION AND ANALYSIS OF A TOTAL OF FIVE (5) COMPOSITE SOIL SAMPLES CONSISTING OF THE FOLLOWING DISTRIBUTION OF THIRTEEN (13) SEPARATE DISCRETE SAMPLES:

SAMPLES	NO. OF DISCRETE SAMPLES
1 EXCAVATION FLOOR	1 DISCRETE SAMPLE
2 NORTH SIDEWALL	1 DISCRETE SAMPLE
3 SOUTH SIDEWALL	1 DISCRETE SAMPLE
4 EAST SIDEWALL	2 DISCRETE SAMPLES
5 WEST SIDEWALL	2 DISCRETE SAMPLES
- THE NORTH TOWER CONCRETE CLEANUP VERIFICATION SAMPLING WILL CONSIST OF THE COLLECTION OF AT LEAST ONE (1) DISCRETE SAMPLE FROM EACH EDGE OF THE REMEDIATION ZONE BEYOND THE CONCRETE REMOVAL AREA WITH THE EXCEPTION OF THE NORTH EDGE WHERE THE TERMINAL EDGE OF THE SLAB WILL BE REMOVED. THIS AREA IS ADJACENT TO NORTH.
- THE SOUTH TOWER CONCRETE CLEANUP VERIFICATION SAMPLING WILL CONSIST OF THE COLLECTION OF APPROXIMATELY TWO (2) DISCRETE SAMPLES FROM EACH EDGE OF THE REMEDIATION ZONE BEYOND THE CONCRETE REMOVAL AREA FOR A TOTAL OF APPROXIMATELY EIGHT (8) DISCRETE SAMPLING POINTS TO BE COMPOSITED INTO ONE (1) SAMPLE PER "EDGE." (e.g. NORTH SIDE WALL).
- CONCRETE WALL CLEANUP VERIFICATION SAMPLING IN EACH TOWER WILL CONSIST OF COLLECTING AT LEAST ONE (1) DISCRETE SAMPLE FROM EACH END AND AT LEAST ONE (1) DISCRETE SAMPLE ABOVE THE VERTICAL LIMIT OF THE WALL PORTION REMOVED FOR A TOTAL OF THREE (3) SAMPLES PER TOWER.
- IN THE EVENT DATA INDICATES PCB CONCENTRATIONS ABOVE TWO PART PER MILLION (2 PPM) IN ANY OF THE COMPOSITE SAMPLES OUTLINED ABOVE, ADDITIONAL EXCAVATION OR CONCRETE REMOVAL WILL BE PERFORMED AT THE CORRESPONDING AREA. CONCRETE ZONE EXCAVATION FLOOR OR SIDEWALL. SUBSEQUENT VERIFICATION SAMPLING WILL BE PERFORMED IN A SIMILAR FASHION AS INITIAL VERIFICATION SAMPLING WHICH WILL INCLUDE COLLECTION POINTS ON AN APPROXIMATELY 2.5 FOOT GRID.
- ALL PCB CONTAMINATED CONCRETE AND SOIL WILL BE EXCAVATED AND DISPOSED OF AS "STATE SPECIAL WASTE" PER WAC 17300 FOR DISPOSAL AT A "SUBTITLE D" LANDFILL PERMITTED TO ACCEPT SUCH WASTE.
- GROUNDWATER WAS NOT ENCOUNTERED DURING ANY TERRACON OR DAMES AND MOORE WORK. AS SUCH NO GROUNDWATER IS ANTICIPATED TO BE IMPACTED BY PLANNED REMEDIAL ACTIVITIES.
- SEE LEGEND FOR APPROXIMATE VERIFICATION SAMPLE LOCATIONS.



APPENDIX B

Terracon - PCBs Concrete and Soil Sampling Investigation Report - January 12,
2016

PCBs Concrete and Soil Sampling Investigation

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

January 12, 2016
UW Project No. 204350
Terracon Project No. BA158014

Prepared for:
University of Washington
Seattle, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

terracon.com

Terracon

Environmental ■ Facilities ■ Geotechnical ■ Materials

January 12, 2016



University of Washington
Capital Projects Office
Box 352205
Seattle, WA 98195-2205

Attn: Mr. Shane Ruegamer

Re: **PCBs Concrete and Soil Sampling Investigation**
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington
UW Project No. 204350
Terracon Project No. BA158014

Dear Mr. Ruegamer:

Terracon Consultants, Inc. (Terracon) is pleased to submit our report of Polychlorinated Biphenyls (PCBs) concrete and soil sampling investigation activities completed at the site referenced above. The report presents data from recent field activities that included collection of concrete and soil samples for chemical analysis. The activities were completed to assess PCBs in concrete and underlying pea gravel fill at McCarty Hall in each of the hall tower transformer rooms. Terracon conducted the PCBs concrete and soil sampling investigation in general accordance with our PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan dated October 7, 2015, and Argus Pacific's Master Agreement for Regulated Building Materials and Engineer Services with the University of Washington.

Terracon appreciates this opportunity to provide environmental services to the University of Washington. Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Terracon Consultants, Inc.

A blue ink signature of Chad Kean, consisting of a stylized 'C' followed by a horizontal line.

Chad Kean, CIH, CHMM, CPSWQ
Project Manager II

A blue ink signature of Michael D. Noll, featuring a stylized 'M' and 'N'.

Michael D. Noll, LG, LHG
Senior Project Manager

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APPENDIX A – EXHIBITS

- Exhibit 1 – Site Location Map
- Exhibit 2 – Sample Locations – McCarty Hall – South
- Exhibit 3 – Sample Locations – McCarty Hall – North
- Exhibit 4 – Sample Locations – McCarty Hall – Central
- Exhibit 5 – Sample Locations – McCarty Hall – Central Hall

APPENDIX B – TABLES

- Table 1 - Summarized Concrete and Soil Analytical Results
- Table 2 - Summarized Investigation Derived Waste Analytical Results

APPENDIX C – ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS

APPENDIX D – Terracon - PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan dated October 7, 2015

**PCBS CONCRETE AND SOIL SAMPLING INVESTIGATION
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington**

**UW Project No. 204350
Terracon Project No. BA158014
January 12, 2016**

1.0 SITE DESCRIPTION

The site is located in the North portion of the University of Washington campus. McCarty Hall is comprised of a north, south and central tower. A Site Location Map showing the site location is included as Exhibit 1 and Site Diagrams for each tower's transformer room areas are included as Exhibits 2 through 5 in Appendix A.

Terracon previously completed a PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan dated October 7, 2015, included as Appendix D. The scope of the work plan and sampling and analytical plan were based on information taken from a previous report completed by Dames & Moore. Dames & Moore completed a Closure Report PCB Remediation at the site in June 1997. As part of an initial investigation, site characterization was conducted in the transformer rooms between November 1994 and March 1995 to determine the nature and extent of PCB contaminated material resulting from transformer oil leaks or spills. The results of the site characterization indicated that PCBs were present in all three transformer rooms at McCarty Hall at concentrations exceeding regulatory action levels under the Toxics Substance Control Act (TSCA). Please refer to the Dames & Moore report included as part of Appendix D for further information regarding the 1994-1995 site characterization and remedial activities.

Dames & Moore conducted remedial activities in the north, south, and central tower transformer rooms in McCarty Hall between July and December 1996. Remedial activities included removal, disposal and/or replacement of the transformers and electrical appurtenances containing PCBs; washing and rinsing of PCB contaminated concrete surfaces; scabbling and encapsulating of the washed PCB contaminated concrete surfaces; removal of selected PCB contaminated concrete slabs and underlying soils; confirmatory sampling and analysis during and following removal or decontamination activities; and waste disposal.

In the north tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of selected concrete slabs and underlying soils. During the initial investigation, five core samples were collected from the concrete floor. One core sample contained 390 milligrams per kilogram (mg/kg, approximately equivalent to parts per million [ppm]) of PCBs. The concrete floor slabs located in the northeast corner and south-central portion of the electrical room were removed and replaced. Following the concrete floor slab removal, one soil sample collected at approximately seven inches below

ground surface (bgs) contained 1.6 ppm PCBs. A total of four wipe sample were collected prior to the slab removal and, based on the wipe sample results (PCBs concentrations ranged from 7 to 470 micrograms per 100 square centimeters [$\mu\text{g}/100\text{cm}^2$]), portions of the floor slab were either removed or encapsulated. In addition, in the non-encapsulated areas, the floors were washed and rinsed and an additional four wipe samples were collected. Based on the results of the final wipe samples (the results ranged from less than 1 $\mu\text{g}/100\text{cm}^2$ to 35 $\mu\text{g}/100\text{cm}^2$), no further remedial action was completed in those areas.

In the south tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, and encapsulation using an epoxy-based paint. A total of 12 post-cleanup surface wipe samples were collected from the concrete floor surface, with results ranging from less than 1 $\mu\text{g}/100\text{cm}^2$ to 35 $\mu\text{g}/100\text{cm}^2$. Based on the wipe sample results, the surfaces were then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan and red from the top to bottom.

In the central transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slabs and underlying soils. During the initial investigation, seven concrete cores and six sub-slab pea gravel samples were collected at depths ranging up to 2.4 feet bgs. Two concrete core samples and two pea gravel samples contained PCBs at concentrations above 10 ppm, the EPA-specified cleanup level for PCBs-impacted material left in place at the site. The concrete floor in the east portion of the electrical room was removed and replaced, along with the underlying pea gravel, to depths up to approximately 3.2 feet bgs. In the western portion of the room, the floor was scabbled. Based on the results of three post-scabbling wipe samples (all less than 10 $\mu\text{g}/100\text{cm}^2$), no further remedial action was completed on the electrical room floor. In addition, the eastern half of the north wall of the electrical room was washed and rinsed. Two final wipe samples were collected from the electrical room wall. Based on the results (both less than 10 $\mu\text{g}/100\text{cm}^2$), no further remedial action was completed on the electrical room wall.

In the hallway areas outside of the central transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of a portion of the concrete slab. Based on the results of the initial investigation and follow-up sampling, portions of the surrounding hallway were washed and rinsed, encapsulated, or removed. Based on the sampling results, the concrete slab in the doorway of the fan room was removed and replaced, and the remainder of the impacted hallway concrete floor area was encapsulated.

Based on the scope of services, limitations, and findings of the report, Terracon recommended that additional concrete and soil sampling be performed in the vicinity of the McCarty Hall transformer rooms in order to assess residual PCBs in concrete and underlying pea gravel fill prior to the planned demolition of the towers.

2.0 SCOPE OF SERVICES

Terracon's scope of work was conducted in general accordance with our PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan dated October 7, 2015, and Argus Pacific's Master Agreement for Regulated Building Materials and Engineer Services with the University of Washington. Our scope of services included completion of the following tasks:

- Performance of pre-mobilization activities including private underground utility clearances and preparation of a site specific health and safety plan;
- Advancement of forty (40) concrete and underlying pea gravel fill collection borings, and collection of concrete and pea gravel fill samples (where present) from each boring;
- Advancement of ten (10) concrete wall borings, and collection of one concrete sample from each boring;
- Completion of laboratory analyses of concrete, pea gravel fill, and investigation derived waste samples; and
- Preparation of this PCBs concrete and soil sampling investigation summary report.

The concrete and soil sampling activities were conducted in order to investigate the presence or absence and concentration of PCBs in concrete and underlying pea gravel fill in the vicinity of the transformer rooms at the site. The purpose of the concrete and soil sampling work was to further characterize concrete and soil in the transformer room areas in order to help determine if the materials will require special handling during the planned building demolition.

2.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed with you, our client, and were not restricted by ASTM E1903-11.

2.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable, or not present during these services. We cannot

represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this investigation. Subsurface conditions may vary from those encountered at specific borings or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

2.3 Reliance

This report has been prepared for the exclusive use of the University of Washington, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of the University of Washington and Terracon. Any unauthorized distribution or reuse is at University of Washington's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, investigation report, and Argus Pacific's Master Agreement for Regulated Building Materials and Engineer Services with the University of Washington.

3.0 FIELD INVESTIGATION

Terracon has a 100% commitment to the safety of all its employees. As such, and in accordance with our *Incident and Injury Free®* safety goals, Terracon conducted the fieldwork under a site specific health and safety plan developed for this project. Work was performed using the Occupational Health and Safety Administration (OSHA) Level D Modified work attire consisting of the following:

- Hard Hat
- Safety Footwear
- Nitrile or Neoprene Rubber Outer Gloves
- Nitrile Glove Liners
- Safety Eye Wear
- Hearing Protection (if within 10 feet of rotary hammer, concrete coring or other equipment which impairs normal conversation at < 5 feet.)
- Half Face Air purify Respirator equipped with HEPA Cartridges (for controlling PCB concrete dust exposure)
- Cotton Coveralls

In an effort to locate underground utilities in the work area, a private utility location service was subcontracted by Terracon to identify the locations and depths of the various utilities located within the structure to avoid damage to such utilities.

3.1 Concrete and Soil Sampling

Field activities were performed within and in the vicinity of the transformer rooms in the North, South and Central towers. Boring locations are depicted on Exhibits 2 through 5 of Appendix A.

Terracon field representatives Adam Stauffer and Kyle Long mobilized to the site on November 10-13 and December 17-18, 2015 to conduct the concrete and soil sampling. Concrete sampling was conducted using rotary hammers and bits to produce pulverized samples of the concrete. Soil sampling was conducted using a clean stainless steel hand auger and stainless steel spoons. Sampling equipment was cleaned using an Alconox® wash and potable water rinse prior to the beginning of the project and before collecting each sample.

Soil borings were advanced to depths ranging from directly below the slab (about 0.5 feet bgs) to approximately 4 feet bgs. Exhibits 2 through 5 indicate the approximate locations of the explorations (Appendix A).

A total of forty (40) concrete samples (designated with a "C" on Exhibits 2 through 5) were collected, ten (10) each from the North and South tower transformer rooms and ten (10) each from the Central transformer room and adjacent hallway. In addition five (5) duplicate concrete samples were collected as field quality control samples, including one each from the South and North towers and three from the Central tower. Concrete samples were extracted by hand using disposable gloves and stainless steel spoons and placed directly into laboratory supplied glassware.

A total of forty-four (44) soil samples (designated with an "S" on Exhibits 2 through 5), consisting of underlying pea gravel fill, were collected and submitted for laboratory analysis. Soil samples were extracted using a clean stainless steel hand auger and stainless steel spoons and placed directly into laboratory supplied glassware. At some locations on the northern portion of the South tower transformer room, the concrete slab was directly underlain by metal pan decking associated with an underground steam tunnel, and no pea gravel fill was encountered. In addition, at one location in each of the electrical transformer rooms, a soil sample was collected at approximately two and four feet bgs to evaluate the deeper underlying soils for PCB impacts. Additional deeper soil samples were also collected and analyzed at all locations where sub-slab PCB concentrations were 2 ppm or greater were detected in the initial sample results from this investigation. Deeper samples were sleeved using a PVC casing to hold back pea gravel to reach the final depths.

Each sample container was labeled with the project number, date, time, boring number and sample number. Sample containers were placed in a chilled cooler immediately after sampling, and subsequently transported to a Washington State-accredited laboratory under strict chain-of-custody procedures.

At the completion of field activities, the borings were decommissioned using clean pea gravel fill upon the conclusion of field work for this investigation.

3.2 Concrete Wall Sampling

A total of ten (10) concrete masonry unit (cmu) wall samples (designated with a “WC” on Exhibits 2 through 5) were collected, three (3) each from the North and South tower transformer rooms and four (4) from the Central transformer room. Concrete wall samples were extracted by hand using disposable gloves and stainless steel spoons and placed directly into laboratory supplied glassware.

Each sample container was labeled with the project number, date, time, boring number and sample number. Sample containers were placed in a chilled cooler immediately after sampling, and subsequently transported to a Washington State-accredited laboratory under strict chain-of-custody procedures.

4.0 RESULTS OF THE FIELD INVESTIGATION

4.1 Geology

In general, Terracon encountered fill material consisting of pea gravel below the concrete slabs. The pea gravel layer varied in thickness from about 2 feet to 4 feet. The northern portion of the South tower transformer room was situated directly above a steam tunnel located beneath the building; therefore, no underlying fill material was encountered.

5.0 ANALYTICAL RESULTS

The selected concrete and soil samples were submitted to ALS Laboratory Group, a Washington-certified laboratory located in Everett, Washington, and analyzed for PCBs using EPA Method 8082. In addition, samples of investigation derived waste (IDW) contained onsite in Department of Transportation-approved steel drums (one concrete/soil drum and one decontamination water drum) were also analyzed for PCBs using EPA Method 8082.

Reported concrete and soil concentrations were compared with the Washington State Department of Ecology (Ecology) Dangerous Waste Regulations (Washington Administrative Code (WAC) 173-303), as applicable. Specifically, the sample results were compared to the less than or equal to 2 ppm (≤ 2 ppm) and <50 ppm “State Special Waste” designations for PCBs. One PCB Arochlor (PCB-1260) was detected in the samples.

The laboratory analytical report and chain-of-custody record are attached in Appendix C. The following sections describe the results of the testing.

5.1 Concrete Slab Sample Results

PCBs concentrations for four (4) of the concrete slab samples exceeded 2 ppm. Three concrete slab samples collected from the northern portion of the South tower transformer room (samples SC-4, SC-5, and SC-6) contained PCBs at concentrations of 12, 8.6, and 16 ppm, respectively. One concrete slab sample collected from the northern portion of the North tower transformer room (sample NC-7) and a duplicate sample (sample NC-11) contained PCBs at concentrations of 3.2 and 2.8 ppm, respectively. The concrete slab samples from the Central tower did not contain PCBs at concentrations exceeding 2 ppm.

The concrete slab sample results are summarized in Table 1 of Appendix B. Exhibits 2 through 5 in Appendix A also show all detectable PCB concentrations.

5.2 Soil Sample Results

PCBs concentrations for four (4) soil samples were detected at or above 2 ppm. Three soil samples collected from the southern and southeastern portions of the North tower transformer room (samples NS-2, NS-3, and NS-9) contained PCBs at concentrations of 24, 3.7, and 2 ppm, respectively. One soil sample collected from the eastern portion of the hallway east of the Central tower transformer room (sample CS-16) contained PCBs at a concentration of 2.5 ppm. All of the soil samples with PCB concentration at or above 2 ppm were collected directly below the slab at the slab-pea gravel interface. The soil samples collected from the South tower did not contain PCBs at concentrations exceeding 2 ppm.

The concrete slab sample results are summarized in Table 1 of Appendix B. Exhibits 2 through 5 in Appendix A also show all detectable PCB concentrations.

5.3 Concrete Wall Sample Results

PCBs concentrations for three (3) of the concrete wall samples exceeded 2 ppm. One concrete wall sample collected from the north wall of the South tower transformer room (sample SWC-1) contained PCBs at a concentration of 2.9 ppm. One concrete wall sample collected from the north wall of the North tower transformer room (sample NWC-1) contained PCBs at a concentration of 2.3 ppm. One concrete wall sample collected from the north wall of the Central tower transformer room (sample CWC-4) contained PCBs at a concentration of 11 ppm.

The concrete wall sample results are summarized in Table 1 of Appendix B.

5.4 Quality Control Sample Results

Field quality control (QC) samples were collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples for this project consisted of five concrete duplicate samples (samples SC-11, NC-11, CC-21, CC-22, and CC-23) and an equipment blank (sample Equipment Blank). The QC sample results are included in Table 1.

The field duplicates consisted of two distinct concrete samples (an original and a duplicate) from the same sample location collected at the same time to the extent practical and using the same sampling techniques. All duplicate sample results were consistent with the primary sample results.

The equipment blank was prepared by pouring a sample of deionized water over decontaminated field sampling equipment prior to the collection of environmental samples. The equipment blank was stored with the other samples and analyzed by the laboratory for PCBs by the same method used for the other samples.

The analytical results for the equipment blank had no detectable levels of PCBs.

5.5 Quality Assurance/Quality Control Results

The analytical results for the current investigation were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering hold times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate (MS/MSD) recovery, and detection limits. QA/QC review was completed using guidance described in *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (Draft Final, USEPA, 2005). Our evaluation assumes that the QA/QC is correct as reported by the laboratory, and merely provides an interpretation of the QA/QC results.

Hold Times. All analyses were completed within specified hold times.

Surrogate Recoveries. All surrogate recoveries were within laboratory limits.

Method Blanks. Analytes were not detected in any of the laboratory method blanks.

MS/MSD Results. MS and MSD recoveries were all within laboratory limits, and Relative Percent Differences (RPDs) between MS and MSD recoveries were all within laboratory limits.

Laboratory Reporting Limits. Reporting limits were below relevant Dangerous Waste cleanup levels.

Data packages were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering holding times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate recovery, and detection limits.

Based upon our interpretation of quality control information provided by the laboratories, it is our opinion that the overall dataset is useable as qualified for the purposes of this investigation.

6.0 INVESTIGATION DERIVED WASTES

One 35-gallon drum of soil and concrete waste and one 55-gallon drum of decontamination water were containerized during the field activities as investigation derived wastes (IDW). Based on the analytical results of a composite sample collected from the soil and concrete drum (sample Concrete, Soil Drum), the IDW contained 1.6 ppm PCBs, and can therefore be disposed of as construction debris. The composite sample collected from the decontamination water drum (sample Water drum) was non-detect for PCBs. Therefore, the IDW water can be disposed of in the sanitary sewer and the metal drum can either be recycled or disposed of as construction debris. The IDW sample results are summarized in Table 2.

7.0 CONCLUSIONS

Based on the scope of services described in this report and subject to the limitations described herein, Terracon concludes the following.

PCBs were identified in portions of the concrete slabs and walls in the North, South and Central towers at concentrations equal to or exceeding 2 ppm, but less than 50 ppm. In addition, PCBs were detected in the pea gravel fill material immediately underlying the concrete slabs at 0.5 feet bgs in the North and Central towers at concentrations equal to or exceeding 2 ppm, but less than 50 ppm.

Based on the sample results, the portions of the concrete floor slabs and/or concrete masonry walls in the South, North, and Central tower transformer rooms, as well as a portion of the shallow pea gravel beneath the concrete floor in the North and Central tower transformer room areas, will require proper disposal as “State Special Waste” per WAC 173-303.

8.0 RECOMMENDATIONS

Based on the findings of this investigation, Terracon does not recommend additional investigation at the site at this time. Terracon will provide removal and disposal recommendations in the PCB Soil and Concrete Remediation Specifications and in a PCB Site Cleanup Work Plan, to be provided under separate cover.

APPENDIX A – EXHIBITS

Exhibit 1 – Topographic Map

Exhibit 2 – Sample Locations – McCarty Hall – South

Exhibit 3 – Sample Locations – McCarty Hall – North

Exhibit 4 – Sample Locations – McCarty Hall – Central

Exhibit 5 – Sample Locations – McCarty Hall – Central Hall



LEGEND: Base map derived from U.S. Geological Survey 7.5 Minute Series Washington King Co. Seattle North Quadrangle 2014 and modified Terracon.

APPROXIMATE SITE LOCATION

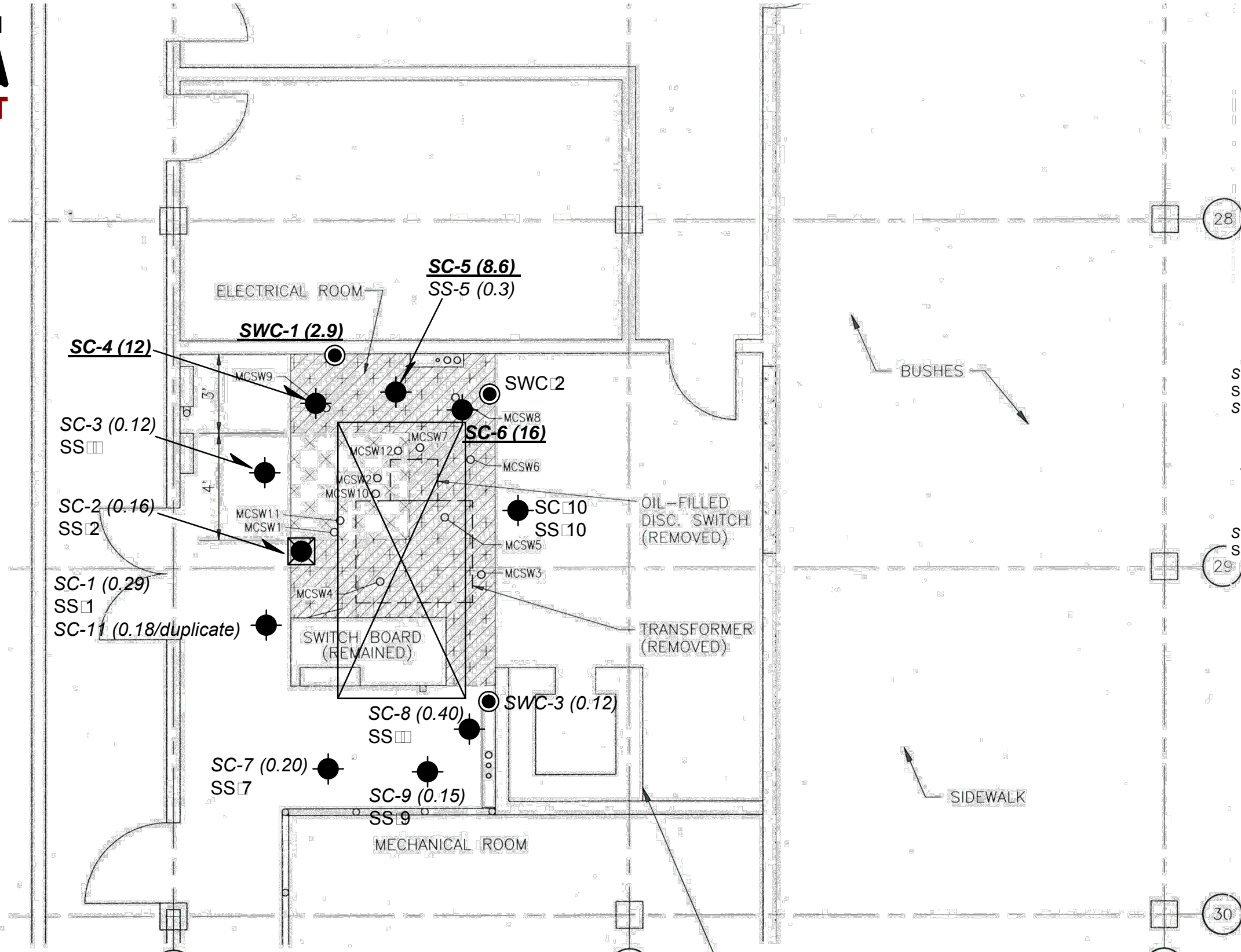
Project Mgr:	CDK
Drawn By:	AAS
Checked By:	CDK
Approved By:	MDN

Project No.	BA158014
Scale:	NOT TO SCALE
File No.	*.dwg
Date:	January 2016

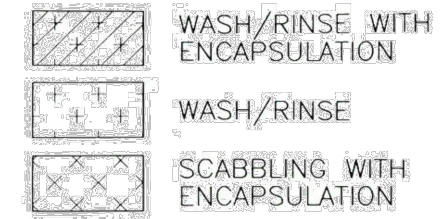
Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

Site Location Map
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

EXHIBIT
1



LEGEND



SURFACE WIPE SAMPLE LOCATION

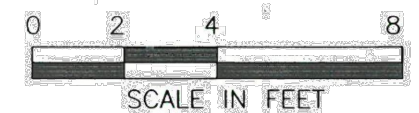
- TOTAL PCB'S DETECTED AT GREATER THAN SITE SPECIFIC CLEANUP LEVEL
- TOTAL PCB'S DETECTED AT LESS THAN OR EQUAL TO SITE SPECIFIC CLEANUP LEVEL

TERRACON LEGEND:

- SC-1 (0.29)
SS:1
SC-11 (0.18/duplicate) ● CONCRETE AND SUB SLAB SOIL SAMPLE NUMBERS AND APPROXIMATE LOCATION
- SWC-1 (2.9) ● CONCRETE MASONRY UNIT (CMU) WALL BLOCK SAMPLE NUMBER AND APPROXIMATE LOCATION
- SC-2 (0.16)
SS:2 ■ CONCRETE AND DEEP SUB SLAB SOIL SAMPLE NUMBER AND APPROXIMATE LOCATION

TERRACON NOTES:

- WHERE DETECTED PCB CONCENTRATIONS FOLLOW SAMPLE NUMBER IN PARENTHESES
- ITALICIZED SAMPLE NUMBERS CONTAIN REPORTABLE PCB CONCENTRATION
- BOLD ITALICIZED UNDERLINED** SAMPLE NUMBERS CONTAIN PCB CONCENTRATION CONSIDERED "STATE SPECIAL WASTE"



Base map DF file provided by Client to Dates Moore Group Company Closure Report, PCB Remediation, McCarty Hall Transformer Vaults dated June 1, 1997 and modified by Terracon.

Project Mgr:	CDK	Project No.	BA158014
Drawn By:	AAS	Scale:	NOT TO SCALE
Checked By:	CDK	File No.	*.dwg
Approved By:	MDN	Date:	January 2016

Terracon
Consulting Engineers and Scientists

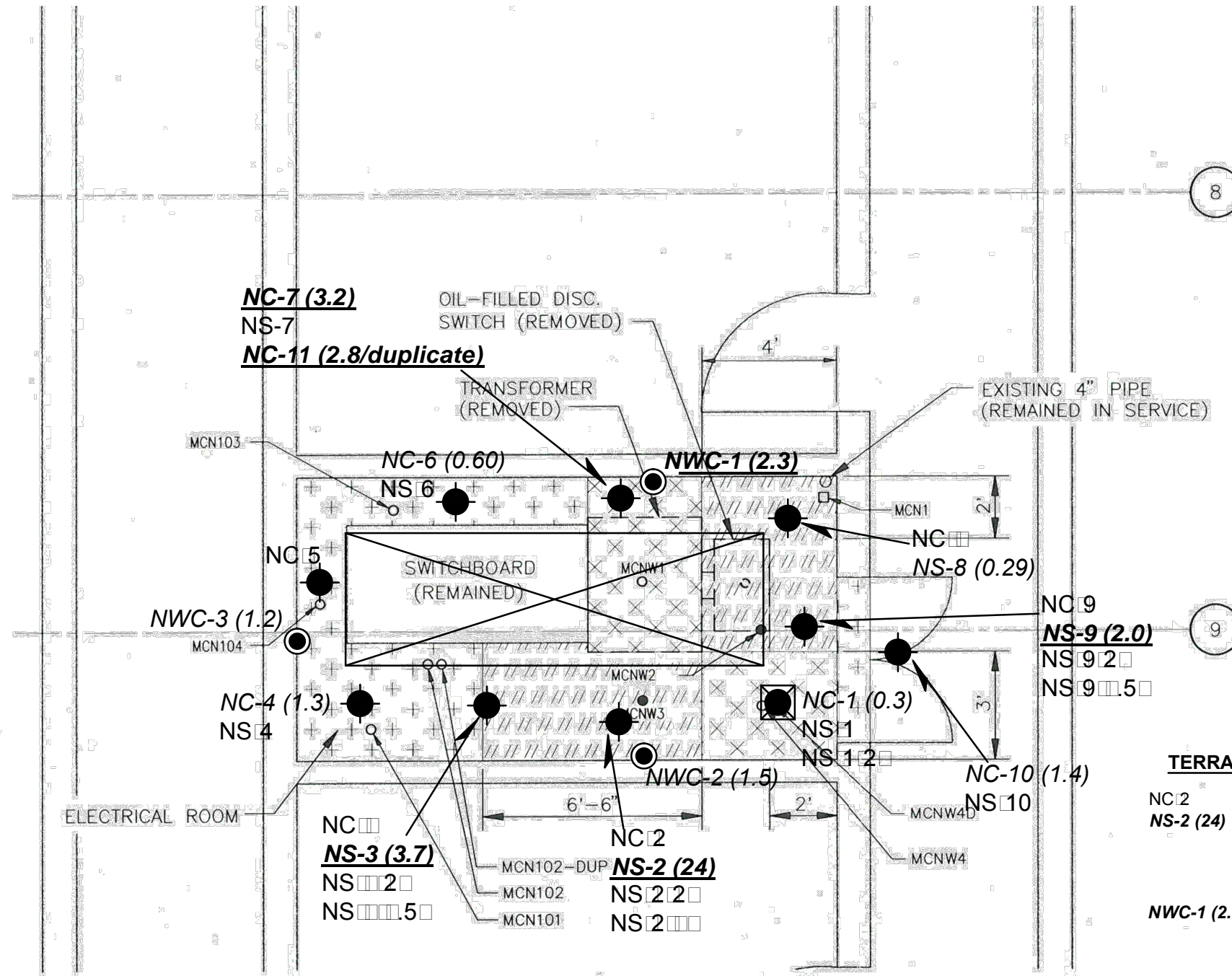
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

Sample Locations - McCarty Hall - South

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

EXHIBIT

2



LEGEND



WASH/RINSE



SCABBLING WITH
ENCAPSULATION



CONCRETE REMOVAL AND
REPLACEMENT

CONCRETE WIPE SAMPLE LOCATION



TOTAL PCBs DETECTED AT GREATER
THAN 100µg/cm²



TOTAL PCBs DETECTED BETWEEN
10µg/100cm² AND 100µg/100cm²



TOTAL PCBs DETECTED AT LESS THAN OR
EQUAL TO 10µg/100cm² OR UNDETECTED

SOIL SAMPLE LOCATION



TOTAL PCBs DETECTED AT GREATER
THAN 10mg/kg



TOTAL PCBs DETECTED AT LESS THAN
OR EQUAL TO 10mg/kg

TERRACON LEGEND:

NC-2
NS-2 (24)



CONCRETE AND SUB SLAB
SOIL SAMPLE NUMBERS AND
APPROXIMATE LOCATION

NWC-1 (2.3)



CONCRETE MASONRY UNIT
CMU WALL BLOCK SAMPLE
NUMBER AND APPROXIMATE
LOCATION

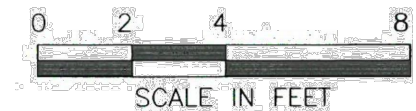
NC-1 (0.3)
NS-1
NS-1.2



CONCRETE AND DEEP SUB SLAB
SOIL SAMPLE NUMBER AND
APPROXIMATE LOCATION

TERRACON NOTES:

- WHERE DETECTED PCB CONCENTRATIONS FOLLOW SAMPLE NUMBER IN PARENTHESES
- ITALICIZED SAMPLE NUMBERS CONTAIN REPORTABLE PCB CONCENTRATION
- BOLD ITALICIZED UNDERLINED** SAMPLE NUMBERS CONTAIN PCB CONCENTRATION CONSIDERED "STATE SPECIAL WASTE"



Based on DF file provided by Client to Dames & Moore for Closure Report, PCB Remediation, McCarty Hall Transformer Vaults dated June 1, 1997 and modified by Terracon.

Project Mgr:	CDK	Project No.	BA158014
Drawn By:	AAS	Scale:	NOT TO SCALE
Checked By:	CDK	File No.	*.dwg
Approved By:	MDN	Date:	January 2016

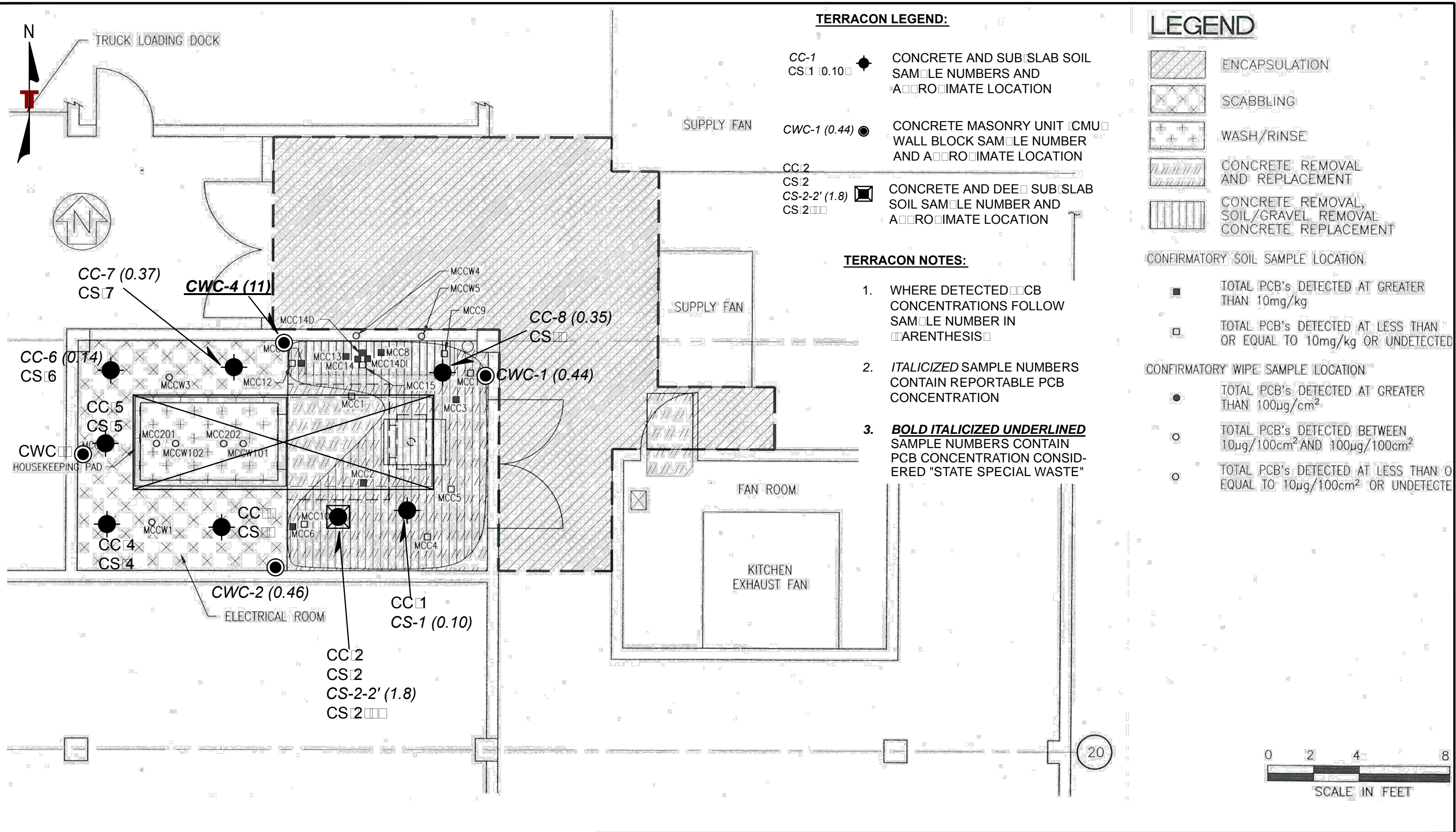
Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

Sample Locations - McCarty Hall - North

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

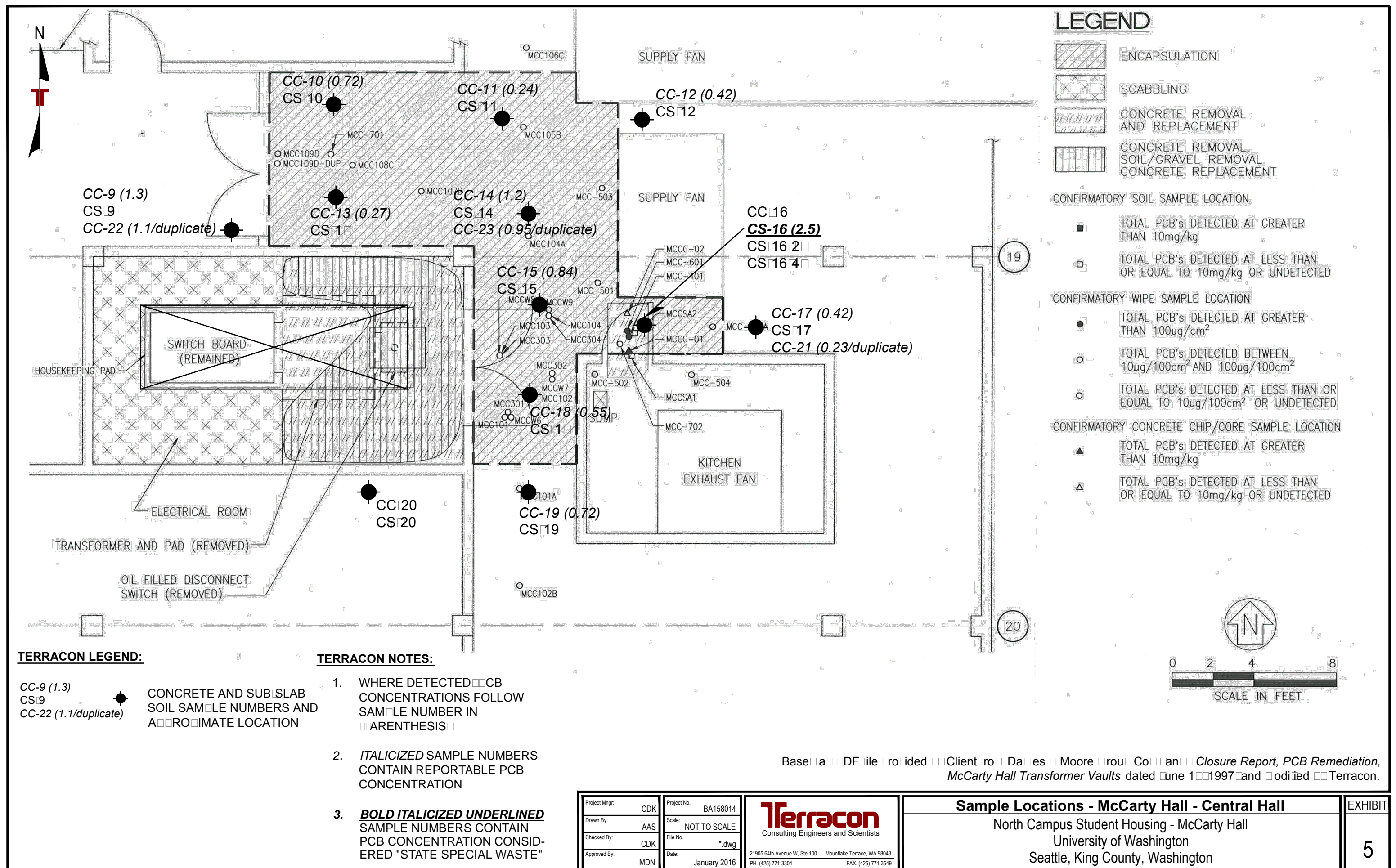
EXHIBIT

3



Based on DF file provided by Client to Dames & Moore for Closure Report, PCB Remediation, McCarty Hall Transformer Vaults dated June 1, 1997 and modified by Terracon.

Project Mgr:	CDK	Project No.	BA158014	Terracon Consulting Engineers and Scientists 21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043 PH. (425) 771-3304 FAX. (425) 771-3549	Sample Locations - McCarty Hall - Central North Campus Student Housing - McCarty Hall University of Washington Seattle, King County, Washington	EXHIBIT 4
Drawn By:	AAS	Scale:	NOT TO SCALE			
Checked By:	CDK	File No.	*.dwg			
Approved By:	MDN	Date:	January 2016			



APPENDIX B – TABLES

Table 1 – Summarized Concrete and Soil Analytical Results

Table 2 – Summarized Investigation Derived Waste Analytical
Results

Table 1 : Summarized Concrete and Soil Analytical Results
North Campus Student Housing - McCarty Hall Replacement
Terracon Consultants Inc. (2015)

[illegible]

Table 1 : Summarized Concrete and Soil Analytical Results
North Campus Student Housing - McCarty Hall Replacement
Terracon Consultants Inc. (2015)

Sample ID	Date	Media	Depth (feet)	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260	PCB-1268
CC-19	11/11/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.72	ND (<0.10)
CS-19	11/11/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
CC-20	11/11/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
CS-20	11/11/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
CC-21 (Duplicate of CC-17)	11/11/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.23	ND (<0.10)
CC-22 (Duplicate of CC-9)	11/11/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.1	ND (<0.10)
CC-23 (Duplicate of CC-14)	11/11/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.95	ND (<0.10)
CWC-1	11/11/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.44	ND (<0.10)
CWC-2	11/11/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.46	ND (<0.10)
CWC-3	11/11/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
CWC-4	11/11/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	11	ND (<0.10)
South Tower Transformer Room Samples											
SC-1	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.29	ND (<0.10)
SC-2	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.16	ND (<0.10)
SC-3	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.12	ND (<0.10)
SC-4	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	12	ND (<0.10)
SC-5	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	8.6	ND (<0.10)
SS-5	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.30	ND (<0.10)
SC-6	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	16	ND (<0.10)
SC-7	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.20	ND (<0.10)
SC-8	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.40	ND (<0.10)
SS-8	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
SC-9	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.15	ND (<0.10)
SS-9	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
SC-10	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
SS-10	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
SC-11 (Duplicate of SC-1)	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.18	ND (<0.10)
SWC-1	11/12/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	2.9	ND (<0.10)
SWC-2	11/12/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
SWC-3	11/12/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.12	ND (<0.10)

Table 1 : Summarized Concrete and Soil Analytical Results
North Campus Student Housing - McCarty Hall Replacement
Terracon Consultants Inc. (2015)

Sample ID	Date	Media	Depth (feet)	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260	PCB-1268
North Tower Transformer Room Samples											
NC-1	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.30	ND (<0.10)
NS-1	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-1-2'	11/12/2015	Soil	2	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-2	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-2	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	24	ND (<0.10)
NS-2-2'	12/18/2015	Soil	2	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-2-3'	12/18/2015	Soil	3	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-3	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-3	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	3.7	ND (<0.10)
NS-3-2'	12/17/2015	Soil	2	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-3-3.5'	12/17/2015	Soil	3.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-4	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.3	ND (<0.10)
NS-4	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-5	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-6	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.60	ND (<0.10)
NS-6	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-7	11/12/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	3.2	ND (<0.10)
NS-7	11/12/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-8	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-8	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	0.29	ND (<0.10)
NC-9	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-9	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	2.0	ND (<0.10)
NS-9-2'	12/18/2015	Soil	2	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NS-9-3.5'	12/18/2015	Soil	3.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-10	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.4	ND (<0.10)
NS-10	11/13/2015	Soil	.5	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
NC-11 (Duplicate of NC-7)	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	2.8	ND (<0.10)
NWC-1	11/13/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	2.3	ND (<0.10)
NWC-2	11/11/2015	CMU	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.5	ND (<0.10)
NWC-3	11/13/2015	Concrete	Surface	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.2	ND (<0.10)
Equipment Blank	11/13/2015	Water	NA	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
Special Regulated Waste Level				2	2	2	2	2	2	2	2

All concentrations presented in parts per million (mg/kg)

Special Regulated Waste ("State Special Waste") levels are >2 ppm (mg/kg) and <50 ppm (mg/kg)

Bold indicates analyte detected, **Bold** and shaded indicates analyte detected above Dangerous Waste "State Special Waste" designation level

PCB - Polychlorinated biphenyl

Table 2 : Summarized Investigation Derived Waste Analytical Results
North Campus Student Housing - McCarty Hall Replacement
Terracon Consultants Inc. (2015)

Sample ID	Date	Media	Depth (feet)	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260	PCB-1268
Concrete, Soil Drum	12/18/2018	Concrete / Soil	NA	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	1.6	ND (<0.10)
Water Drum	12/18/2018	Decon. Water	NA	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
Special Regulated Waste Level				2	2	2	2	2	2	2	2

All concentrations presented in parts per million (mg/kg)

Special Regulated Waste ("State Special Waste") levels are >2 ppm (mg/kg) and <50 ppm (mg/kg)

Bold indicates analyte detected

PCB - Polychlorinated biphenyl

APPENDIX C – ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS



November 30, 2015

Mr. Chad Kean
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Kean,

On November 16th, 92 samples were received by our laboratory and assigned our laboratory project number EV15110106. The project was identified as your BA158014. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 11/30/2015
ALS JOB#: EV15110106
ALS SAMPLE#: EV15110106-01
CLIENT CONTACT: Chad Kean
DATE RECEIVED: 11/16/2015
CLIENT PROJECT: BA158014
COLLECTION DATE: 11/10/2015 10:41:00 AM
CLIENT SAMPLE ID: CC-1
WDOE ACCREDITATION: C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	82.0	11/23/2015	GAP
DCB	EPA-8082	104	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-02
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 10:41:00 AM
CLIENT SAMPLE ID	CS-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1260	EPA-8082	0.10	0.10	1	MG/KG	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	104	11/23/2015	GAP
DCB	EPA-8082	121	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-03
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:23:00 AM
CLIENT SAMPLE ID	CC-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	113	11/23/2015	GAP
DCB	EPA-8082	125	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-04
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:23:00 AM
CLIENT SAMPLE ID	CS-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	11/23/2015	GAP
DCB	EPA-8082	133	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-05
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 9:01:00 AM
CLIENT SAMPLE ID	CS-2-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP
PCB-1260	EPA-8082	1.8	0.10	1	MG/KG	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	101	11/23/2015	GAP
DCB	EPA-8082	120	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-06
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 9:14:00 AM
CLIENT SAMPLE ID	CS-2-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	82.0	11/24/2015	GAP
DCB	EPA-8082	107	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-07
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:20:00 AM
CLIENT SAMPLE ID	CC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	101	11/24/2015	GAP
DCB	EPA-8082	114	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-08
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:20:00 AM
CLIENT SAMPLE ID	CS-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	98.0	11/24/2015	GAP
DCB	EPA-8082	117	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-09
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:57:00 AM
CLIENT SAMPLE ID	CC-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.0	11/24/2015	GAP
DCB	EPA-8082	114	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-10
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 11:57:00 AM
CLIENT SAMPLE ID	CS-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.0	11/24/2015	GAP
DCB	EPA-8082	115	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-11
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 12:38:00 PM
CLIENT SAMPLE ID	CC-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.0	11/24/2015	GAP
DCB	EPA-8082	106	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-12
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 12:38:00 PM
CLIENT SAMPLE ID	CS-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	102	11/24/2015	GAP
DCB	EPA-8082	122	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-13
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 1:18:00 PM
CLIENT SAMPLE ID	CC-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.14	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	99.0	11/24/2015	GAP
DCB	EPA-8082	119	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-14
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 1:18:00 PM
CLIENT SAMPLE ID	CS-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	91.0	11/24/2015	GAP
DCB	EPA-8082	110	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-15
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 1:59:00 PM
CLIENT SAMPLE ID	CC-7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.37	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	113	11/24/2015	GAP
DCB	EPA-8082	136	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-16
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 1:59:00 PM
CLIENT SAMPLE ID	CS-7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	105	11/24/2015	GAP
DCB	EPA-8082	128	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-17
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 2:48:00 PM
CLIENT SAMPLE ID	CC-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.35	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	88.0	11/24/2015	GAP
DCB	EPA-8082	110	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-18
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/10/2015 2:48:00 PM
CLIENT SAMPLE ID	CS-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	91.0	11/24/2015	GAP
DCB	EPA-8082	111	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-19
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 8:26:00 AM
CLIENT SAMPLE ID	CC-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	1.3	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	104	11/24/2015	GAP
DCB	EPA-8082	127	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-20
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 8:26:00 AM
CLIENT SAMPLE ID	CS-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	98.0	11/24/2015	GAP
DCB	EPA-8082	121	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-21
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:42:00 AM
CLIENT SAMPLE ID	CC-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.72	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	80.0	11/24/2015	GAP
DCB	EPA-8082	118	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-22
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:42:00 AM
CLIENT SAMPLE ID	CS-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	96.0	11/24/2015	GAP
DCB	EPA-8082	120	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	11/30/2015
		ALS JOB#:	EV15110106
		ALS SAMPLE#:	EV15110106-23
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:39:00 AM
CLIENT SAMPLE ID	CC-11	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.24	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	55.0	11/24/2015	GAP
DCB	EPA-8082	82.0	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-24
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:39:00 AM
CLIENT SAMPLE ID	CS-11	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	111	11/24/2015	GAP
DCB	EPA-8082	136	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-25
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 12:20:00 PM
CLIENT SAMPLE ID	CC-12	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.42	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	82.0	11/24/2015	GAP
DCB	EPA-8082	122	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-26
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 12:20:00 PM
CLIENT SAMPLE ID	CS-12	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	106	11/24/2015	GAP
DCB	EPA-8082	134	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-27
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 12:24:00 PM
CLIENT SAMPLE ID	CC-13	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.27	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	103	11/24/2015	GAP
DCB	EPA-8082	146	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-28
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 12:24:00 PM
CLIENT SAMPLE ID	CS-13	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	11/24/2015	GAP
DCB	EPA-8082	138	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-29
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:12:00 PM
CLIENT SAMPLE ID	CC-14	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	1.2	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	104	11/24/2015	GAP
DCB	EPA-8082	134	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-30
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:12:00 PM
CLIENT SAMPLE ID	CS-14	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	107	11/24/2015	GAP
DCB	EPA-8082	129	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-31
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:11:00 PM
CLIENT SAMPLE ID	CC-15	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP
PCB-1260	EPA-8082	0.84	0.10	1	MG/KG	11/24/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/24/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	83.0	11/24/2015	GAP
DCB	EPA-8082	119	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-32
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:11:00 PM
CLIENT SAMPLE ID	CS-15	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	80.0	11/25/2015	GAP
DCB	EPA-8082	131	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-33
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:55:00 PM
CLIENT SAMPLE ID	CC-16	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.0	11/25/2015	GAP
DCB	EPA-8082	129	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-34
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:55:00 PM
CLIENT SAMPLE ID	CS-16	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	2.5	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	97.0	11/25/2015	GAP
DCB	EPA-8082	116	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-35
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 2:15:00 PM
CLIENT SAMPLE ID	CC-17	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.42	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	102	11/25/2015	GAP
DCB	EPA-8082	119	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-36
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 2:15:00 PM
CLIENT SAMPLE ID	CS-17	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	98.0	11/25/2015	GAP
DCB	EPA-8082	123	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-37
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 3:11:00 PM
CLIENT SAMPLE ID	CC-18	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.55	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	78.0	11/25/2015	GAP
DCB	EPA-8082	116	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	11/30/2015
		ALS JOB#:	EV15110106
CLIENT CONTACT:	Chad Kean	ALS SAMPLE#:	EV15110106-38
CLIENT PROJECT:	BA158014	DATE RECEIVED:	11/16/2015
CLIENT SAMPLE ID	CS-18	COLLECTION DATE:	11/11/2015 3:11:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	121	11/25/2015	GAP
DCB	EPA-8082	147	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-39
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 4:01:00 PM
CLIENT SAMPLE ID	CC-19	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.72	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	107	11/25/2015	GAP
DCB	EPA-8082	128	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-40
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 4:01:00 PM
CLIENT SAMPLE ID	CS-19	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	96.0	11/25/2015	GAP
DCB	EPA-8082	121	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-41
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 4:49:00 PM
CLIENT SAMPLE ID	CC-20	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	11/25/2015	GAP
DCB	EPA-8082	138	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-42
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 4:49:00 PM
CLIENT SAMPLE ID	CS-20	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	96.9	11/25/2015	GAP
DCB	EPA-8082	123	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-43
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 2:15:00 PM
CLIENT SAMPLE ID	CC-21	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.23	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	105	11/25/2015	GAP
DCB	EPA-8082	127	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-44
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 8:26:00 AM
CLIENT SAMPLE ID	CC-22	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	1.1	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	91.6	11/25/2015	GAP
DCB	EPA-8082	114	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-45
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 1:12:00 PM
CLIENT SAMPLE ID	CC-23	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.95	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	90.1	11/25/2015	GAP
DCB	EPA-8082	121	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-46
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 10:03:00 AM
CLIENT SAMPLE ID	CWC-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.44	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	86.7	11/25/2015	GAP
DCB	EPA-8082	106	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-47
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 10:44:00 AM
CLIENT SAMPLE ID	CWC-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.46	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	108	11/25/2015	GAP
DCB	EPA-8082	129	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-48
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:13:00 AM
CLIENT SAMPLE ID	CWC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.2	11/25/2015	GAP
DCB	EPA-8082	117	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-49
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:26:00 AM
CLIENT SAMPLE ID	CWC-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1221	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1232	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1242	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1248	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1254	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1260	EPA-8082	11	1.0	10	MG/KG	11/30/2015	GAP
PCB-1268	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX 10X Dilution	EPA-8082	141	11/30/2015	GAP
DCB 10X Dilution	EPA-8082	190 GS2	11/30/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
 GS2 - Surrogate outside of control limits due to dilution.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-50
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 9:12:00 AM
CLIENT SAMPLE ID	SC-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.29	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.4	11/25/2015	GAP
DCB	EPA-8082	117	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-51
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 1:07:00 PM
CLIENT SAMPLE ID	SC-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.16	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	83.9	11/25/2015	GAP
DCB	EPA-8082	124	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-52
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 11:50:00 AM
CLIENT SAMPLE ID	SC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.12	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	90.8	11/25/2015	GAP
DCB	EPA-8082	109	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-53
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 11:01:00 AM
CLIENT SAMPLE ID	SC-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1221	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1232	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1242	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1248	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1254	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1260	EPA-8082	12	1.0	10	MG/KG	11/30/2015	GAP
PCB-1268	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX 10X Dilution	EPA-8082	121	11/30/2015	GAP
DCB 10X Dilution	EPA-8082	170 GS2	11/30/2015	GAP

GS2 - Surrogate outside of control limits due to dilution.

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-54
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 10:11:00 AM
CLIENT SAMPLE ID	SC-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1221	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1232	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1242	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1248	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1254	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1260	EPA-8082	8.6	1.0	10	MG/KG	11/30/2015	GAP
PCB-1268	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX 10X Dilution	EPA-8082	121	11/30/2015	GAP
DCB 10X Dilution	EPA-8082	193 GS2	11/30/2015	GAP

GS2 - Surrogate outside of control limits due to dilution.

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-55
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 10:11:00 AM
CLIENT SAMPLE ID	SS-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.30	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	81.5	11/25/2015	GAP
DCB	EPA-8082	119	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	11/30/2015
		ALS JOB#:	EV15110106
		ALS SAMPLE#:	EV15110106-56
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 9:15:00 AM
CLIENT SAMPLE ID	SC-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1221	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1232	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1242	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1248	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1254	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1260	EPA-8082	16	1.0	10	MG/KG	11/30/2015	GAP
PCB-1268	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX 10X Dilution	EPA-8082	123	11/30/2015	GAP
DCB 10X Dilution	EPA-8082	189 GS2	11/30/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
GS2 - Surrogate outside of control limits due to dilution.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-57
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 9:31:00 AM
CLIENT SAMPLE ID	SC-7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.20	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	11/25/2015	GAP
DCB	EPA-8082	141	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-58
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 10:33:00 AM
CLIENT SAMPLE ID	SC-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.40	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	100	11/25/2015	GAP
DCB	EPA-8082	125	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-59
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 10:33:00 AM
CLIENT SAMPLE ID	SS-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	105	11/25/2015	GAP
DCB	EPA-8082	131	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-60
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 11:29:00 AM
CLIENT SAMPLE ID	SC-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.15	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.9	11/25/2015	GAP
DCB	EPA-8082	115	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-61
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 3:13:00 PM
CLIENT SAMPLE ID	SC-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.6	11/25/2015	GAP
DCB	EPA-8082	92.6	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-62
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 3:13:00 PM
CLIENT SAMPLE ID	SS-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.2	11/25/2015	GAP
DCB	EPA-8082	94.7	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-63
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 9:12:00 AM
CLIENT SAMPLE ID	SC-11	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.18	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	92.5	11/25/2015	GAP
DCB	EPA-8082	94.5	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-64
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 3:48:00 PM
CLIENT SAMPLE ID	SWC-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	2.9	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	93.4	11/25/2015	GAP
DCB	EPA-8082	95.2	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	11/30/2015
		ALS JOB#:	EV15110106
CLIENT CONTACT:	Chad Kean	ALS SAMPLE#:	EV15110106-65
CLIENT PROJECT:	BA158014	DATE RECEIVED:	11/16/2015
CLIENT SAMPLE ID	SWC-2	COLLECTION DATE:	11/12/2015 4:17:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	92.8	11/25/2015	GAP
DCB	EPA-8082	93.2	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-66
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 4:50:00 PM
CLIENT SAMPLE ID	SWC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.12	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	91.0	11/25/2015	GAP
DCB	EPA-8082	93.4	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-67
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 6:14:00 PM
CLIENT SAMPLE ID	NC-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.30	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	83.7	11/25/2015	GAP
DCB	EPA-8082	90.5	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-68
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 6:14:00 PM
CLIENT SAMPLE ID	NS-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.3	11/25/2015	GAP
DCB	EPA-8082	92.6	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-69
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 4:15:00 PM
CLIENT SAMPLE ID	NC-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	104	11/25/2015	GAP
DCB	EPA-8082	106	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-70
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 4:15:00 PM
CLIENT SAMPLE ID	NS-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1221	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1232	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1242	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1248	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1254	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP
PCB-1260	EPA-8082	24	1.0	10	MG/KG	11/30/2015	GAP
PCB-1268	EPA-8082	U	1.0	10	MG/KG	11/30/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX 10X Dilution	EPA-8082	99.0	11/30/2015	GAP
DCB 10X Dilution	EPA-8082	137	11/30/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-71
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 3:31:00 PM
CLIENT SAMPLE ID	NC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	115	11/25/2015	GAP
DCB	EPA-8082	118	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-72
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 3:31:00 PM
CLIENT SAMPLE ID	NS-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	3.7	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	99.8	11/25/2015	GAP
DCB	EPA-8082	104	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-73
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 1:48:00 PM
CLIENT SAMPLE ID	NC-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	1.3	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	103	11/25/2015	GAP
DCB	EPA-8082	103	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-74
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 1:48:00 PM
CLIENT SAMPLE ID	NS-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	99.3	11/25/2015	GAP
DCB	EPA-8082	100	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-75
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 6:56:00 PM
CLIENT SAMPLE ID	NC-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.3	11/25/2015	GAP
DCB	EPA-8082	92.2	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-76
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 7:41:00 PM
CLIENT SAMPLE ID	NC-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.60	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	103	11/25/2015	GAP
DCB	EPA-8082	109	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-77
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 7:41:00 PM
CLIENT SAMPLE ID	NS-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	97.3	11/25/2015	GAP
DCB	EPA-8082	104	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-78
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 8:30:00 PM
CLIENT SAMPLE ID	NC-7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	3.2	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	96.8	11/25/2015	GAP
DCB	EPA-8082	110	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-79
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 8:30:00 PM
CLIENT SAMPLE ID	NS-7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	92.1	11/25/2015	GAP
DCB	EPA-8082	98.4	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-80
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 10:55:00 AM
CLIENT SAMPLE ID	NC-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	80.7	11/25/2015	GAP
DCB	EPA-8082	86.3	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-81
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 10:55:00 AM
CLIENT SAMPLE ID	NS-8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	0.29	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	51.1	11/25/2015	GAP
DCB	EPA-8082	56.4	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-82
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 11:30:00 AM
CLIENT SAMPLE ID	NC-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	49.8	11/25/2015	GAP
DCB	EPA-8082	53.0	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-83
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 11:30:00 AM
CLIENT SAMPLE ID	NS-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	2.0	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	100	11/25/2015	GAP
DCB	EPA-8082	122	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-84
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 12:10:00 PM
CLIENT SAMPLE ID	NC-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	1.4	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	115	11/25/2015	GAP
DCB	EPA-8082	140	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-85
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 12:10:00 PM
CLIENT SAMPLE ID	NS-10	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	114	11/25/2015	GAP
DCB	EPA-8082	135	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-86
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 12:18:00 PM
CLIENT SAMPLE ID	NWC-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	2.3	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	117	11/25/2015	GAP
DCB	EPA-8082	136	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-87
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/11/2015 11:11:00 AM
CLIENT SAMPLE ID	NWC-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	1.5	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	120	11/25/2015	GAP
DCB	EPA-8082	148	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-88
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 12:56:00 PM
CLIENT SAMPLE ID	NWC-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	1.2	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	11/25/2015	GAP
DCB	EPA-8082	136	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-89
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 11:29:00 AM
CLIENT SAMPLE ID	SS-9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	131	11/25/2015	GAP
DCB	EPA-8082	160 GS4	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

GS4 - Surrogate outside of control limits with a high bias. Associated compounds non-detect. No corrective action taken.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-90
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/12/2015 6:30:00 PM
CLIENT SAMPLE ID	NS-1-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	97.4	11/25/2015	GAP
DCB	EPA-8082	126	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	11/30/2015
		ALS JOB#:	EV15110106
CLIENT CONTACT:	Chad Kean	ALS SAMPLE#:	EV15110106-91
CLIENT PROJECT:	BA158014	DATE RECEIVED:	11/16/2015
CLIENT SAMPLE ID	NC-11	COLLECTION DATE:	11/12/2015 8:30:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP
PCB-1260	EPA-8082	2.8	0.10	1	MG/KG	11/25/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	11/25/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	94.0	11/25/2015	GAP
DCB	EPA-8082	140	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	11/30/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15110106
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15110106-92
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	11/16/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	11/13/2015 4:33:00 PM
CLIENT SAMPLE ID	Equip. Method Blank	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	UG/L	11/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	60.0	11/23/2015	GAP
DCB	EPA-8082	88.0	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 11/30/2015
ALS SDG#: EV15110106
WDOE ACCREDITATION: C601

CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY BLANK RESULTS

MBLK-11242015 - Batch R265464 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1221	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1232	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1242	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1248	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1254	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1260	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP
PCB-1268	EPA-8082	U		MG/KG	0.10	11/24/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-11252015 - Batch R265459 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1221	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1232	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1242	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1248	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1254	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1260	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1268	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-265553 - Batch R265553 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1221	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1232	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1242	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1248	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1254	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1260	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1268	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

DATE: 11/30/2015
ALS SDG#: EV15110106
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBLK-265564 - Batch R265564 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1221	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1232	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1242	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1248	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1254	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1260	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1268	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-265573 - Batch R265573 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1221	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1232	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1242	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1248	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1254	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1260	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP
PCB-1268	EPA-8082	U		MG/KG	0.10	11/25/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-11232015 - Batch R265466 - Water by EPA-8082

ANALYTE	METHOD	RESULTS	QUAL	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1221	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1232	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1242	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1248	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1254	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1260	EPA-8082	U		UG/L	0.10	11/23/2015	GAP
PCB-1268	EPA-8082	U		UG/L	0.10	11/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 11/30/2015
ALS SDG#: EV15110106
WDOE ACCREDITATION: C601

CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R265459 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	109			11/25/2015	GAP
PCB-1016 - BSD	EPA-8082	117	7		11/25/2015	GAP
PCB-1260 - BS	EPA-8082	105			11/25/2015	GAP
PCB-1260 - BSD	EPA-8082	111	6		11/25/2015	GAP

ALS Test Batch ID: R265464 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	103			11/24/2015	GAP
PCB-1016 - BSD	EPA-8082	115	11		11/24/2015	GAP
PCB-1260 - BS	EPA-8082	99.0			11/24/2015	GAP
PCB-1260 - BSD	EPA-8082	111	11		11/24/2015	GAP

ALS Test Batch ID: R265553 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	51.0			11/25/2015	GAP
PCB-1016 - BSD	EPA-8082	52.5	3		11/25/2015	GAP
PCB-1260 - BS	EPA-8082	58.0			11/25/2015	GAP
PCB-1260 - BSD	EPA-8082	51.9	11		11/25/2015	GAP

ALS Test Batch ID: R265564 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	61.5			11/25/2015	GAP
PCB-1016 - BSD	EPA-8082	61.8	1		11/25/2015	GAP
PCB-1260 - BS	EPA-8082	76.1			11/25/2015	GAP
PCB-1260 - BSD	EPA-8082	75.5	1		11/25/2015	GAP

ALS Test Batch ID: R265573 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	106			11/25/2015	GAP
PCB-1016 - BSD	EPA-8082	141	28	SR1	11/25/2015	GAP
PCB-1260 - BS	EPA-8082	101			11/25/2015	GAP
PCB-1260 - BSD	EPA-8082	138	31	SR1	11/25/2015	GAP

SR1 - RPD outside of control limits.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 11/30/2015
ALS SDG#: EV15110106
WDOE ACCREDITATION: C601
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R265466 - Water by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	104			11/23/2015	GAP
PCB-1016 - BSD	EPA-8082	121	15		11/23/2015	GAP
PCB-1260 - BS	EPA-8082	86.0			11/23/2015	GAP
PCB-1260 - BSD	EPA-8082	100	15		11/23/2015	GAP

APPROVED BY

Laboratory Director



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Date 11/16/15 Page 1 Of 10

NWTPH-HClD	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>	PCB <input checked="" type="checkbox"/> <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082	Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>	Metals Other (Specify)	TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
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[illegible]

SIGNATURES (Name, Company, Date, Time):

TURNAROUND Organic, Metals & Inorganic Analysis

0 1 2 3 4 5

Standard
5
3
1
SAME DAY

*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

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Date 11/16/15 page 2 of 10

NW/TPH-HCID
NW/TPH-DX
NW/TPH-GX
BTEX by EPA-8021
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input checked="" type="checkbox"/>
Halogenated Volatiles by EPA 8260
Volatile Organic Compounds by EPA 8260
EDB / EDC by EPA 8260 SIM (water)
EDB / EDC by EPA 8260 (soil)
Semivolatile Organic Compounds by EPA 8270
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>
(PCBs) <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/ <u>8082</u>
Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pb Pol <input type="checkbox"/> TAL
Metals Other (Specify)
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>
OTHER (Specify)
NUMBER OF CONTAINERS
RECEIVED IN GOOD CONDITION?

ANALYSIS REQUESTED	OTHER (Specify)
--------------------	-----------------

SIGNATURES (Name, Company, Date, Time):

TURNAROUND
Organic, Metals & Inorganic Analysis

SAME	1	2	3	5	10
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Fuels & Hydrocarbon Analysis

SAME DAY	1	3	5
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Standard

*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

EVIS110106

Date 11/16/15 Page 3 Of 10

ANALYSIS REQUESTED		OTHER (Specify)	
NWTPH-HCID			
NWTPH-DX			
NWTPH-GX			
BTEX by EPA-8021			
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>			
Halogenated Volatiles by EPA 8260			
Volatile Organic Compounds by EPA 8260			
EDB / EDC by EPA 8260 SIM (water)			
EDB / EDC by EPA 8260 (soil)			
Semivolatile Organic Compounds by EPA 8270			
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>			
PCB <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081 <u>8083</u>			
Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>			
Metals Other (Specify)			
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>			
NUMBER OF CONTAINERS		RECEIVED IN GOOD CONDITION?	

ANALYSIS REQUESTED		OTHER (Specify)	
NWTPH-HCID			
NWTPH-DX			
NWTPH-GX			
BTEX by EPA-8021			
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>			
Halogenated Volatiles by EPA 8260			
Volatile Organic Compounds by EPA 8260			
EDB / EDC by EPA 8260 SIM (water)			
EDB / EDC by EPA 8260 (soil)			
Semivolatile Organic Compounds by EPA 8270			
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>			
PCB <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081 <u>8083</u>			
Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>			
Metals Other (Specify)			
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>			
NUMBER OF CONTAINERS		RECEIVED IN GOOD CONDITION?	

SIGNATURES (Name, Company, Date, Time):

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: D. J. Ferracan 11/16/15 1:10

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis

OTHER:

Received By: Shawn Robinson As 11/16/15 1:10 pm

Standard

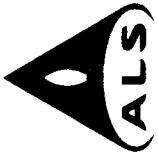
10	5	3	2	1
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Fuels & Hydrocarbon Analysis

2. Relinquished By: _____
Received By: _____

5 3 1 SAME DAY Standard

*Turnaround request less than standard may incur Rush Charges



ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
<http://www.alsglobal.com>

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV1510106

Date 11/16/15 Page 4 Of 10

PROJECT ID: REPORT TO COMPANY:				ANALYSIS REQUESTED										OTHER (Specify)									
PROJECT MANAGER:				PROJECT MANAGER:										PROJECT MANAGER:									
ADDRESS:				ADDRESS:										ADDRESS:									
PHONE:				PHONE:										PHONE:									
P.O. #:				P.O. #:										P.O. #:									
INVOICE TO COMPANY:				INVOICE TO COMPANY:										INVOICE TO COMPANY:									
ATTENTION:				ATTENTION:										ATTENTION:									
ADDRESS:				ADDRESS:										ADDRESS:									
SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM	PCBs <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/5082	Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> TAL <input type="checkbox"/>	Metals Other (Specify)	TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>	RECEIVED IN GOOD CONDITION?			
1. CC-15	11/11/15	13:11	other	31																	2		
2. CS-15		13:11		32																	2		
3. CC-16		13:55		33																	2		
4. CS-16		13:55		34																	2		
5. CC-17		14:15		35																	2		
6. CS-17		14:15		36																	2		
7. CC-18		15:11		37																	2		
8. CS-18		15:11		38																	2		
9. CC-19		16:01		39																	2		
10. CS-19		16:01	✓	40																	2		

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Shawn Peterson 11/16/15 1:10

Received By: Shawn Peterson 11/16/15 1:10

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED IN Business Days*
OTHER: _____

Specify: _____

Organic, Metals & Inorganic Analysis

Fuels & Hydrocarbon Analysis

Standard

*Turnaround request less than standard may incur Rush Charges



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Everett, WA 98208
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Chain Of Custody/ Laboratory Analysis Request

ALS Job#

EV15110106

Date 11/16/15 Page 5 of 10

PROJECT ID: REPORT TO COMPANY:				ANALYSIS REQUESTED										OTHER (Specify)	NUMBER OF CONTAINERS		RECEIVED IN GOOD CONDITION?								
PROJECT MANAGER:				PROJECT MANAGER:										OTHER (Specify)											
ADDRESS:				ADDRESS:										OTHER (Specify)											
PHONE:				PHONE:										OTHER (Specify)											
P.O. #:				P.O. #:										OTHER (Specify)											
INVOICE TO COMPANY:				INVOICE TO COMPANY:										OTHER (Specify)											
ATTENTION:				ATTENTION:										OTHER (Specify)											
ADDRESS:				ADDRESS:										OTHER (Specify)											
SAMPLE I.D.				DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTX by EPA-8021	MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semi-volatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>	PCB <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082 <input type="checkbox"/>	Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>	Metals Other (Specify)	TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>			
1. CC-20				11/11/15	16:49	Other	41																		
2. CS-20					16:49		42																		
3. CC-21					14:15		43																		
4. CC-22					8:26		44																		
5. CC-23					13:12		45																		
6. CWC-1				11/11/15	10:03		46																		
7. CWC-2					10:44		47																		
8. CWC-3					11:13		48																		
9. CWC-4					11:26		49																		
10. SC-1				11/12/15	9:12	✓	50																		

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Shawn Robinson 11/16/15 1:10

Received By: Shawn Robinson 11/16/15 1:10 pm

2. Relinquished By:

Received By:

TURNAROUND REQUESTED in Business Days*
Organic, Metals & Inorganic Analysis

OTHER: Specify: 10 Standard 10 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

Fuels & Hydrocarbon Analysis

Standard 10 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

Date 11/16/15 Page 6 Of 10[illegible]

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Jeffery Terrace 11/16/15 1:10
Received By: Shawn Coleman AC 11/16/15 1:10pm

Received By: _____

TURNAROUND REQUESTED in Business Days*
OTHER: Organic, Metals & Inorganic Analysis

Standard

10	5	3	2	1
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Fuels & Hydrocarbon Analysis

Standard

5	3	1	SAME DAY
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*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

(423) 330-2020
<http://www.alsglobal.com>

ANALYSIS REQUESTED						OTHER (Specify)														
						NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>	PB, <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082	Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pt Pol <input type="checkbox"/> TAL <input type="checkbox"/>	Metals Other (Specify)	TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>
PROJECT ID:																				
REPORT TO COMPANY:																				
PROJECT MANAGER:																				
ADDRESS:																				
PHONE:																				
FAX:																				
E-MAIL:																				
INVOICE TO COMPANY:																				
ATTENTION:																				
ADDRESS:																				
SAMPLE I.D.	DATE	TIME	TYPE	LAB#																
1. SC - 10	11/12/15	15:13	Other	61																
2. SS - 10		15:13		62																
3. SC - 11		9:12		63																
4. SWC - 1		15:48		64																
5. SWC - 2		16:17		65																
6. SWC - 3		16:50		66																
7. NC - 1		18:14		67																
8. NS - 1	11/13/15	18:14		68																
9. NC - 2	11/13/15	16:15		69																
10. NS - 2		16:15		70																

SIGNATURES (Name, Company, Date, Time):

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: S. M. Ly Teracon 11/16/15 1:10

Received By: Sharon Robinson 11/16/15 1:10pm

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*
OTHER: Organic, ~~Metals~~ & Inorganic Analysis

Fuels & Hydrocarbon Analysis

Standard	10	5	3	2	1
Standard	10	5	3	2	1

SAME DAY

*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

(423) 330-2020
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Date 11/16/15 Page 8 Of 10

[illegible]

SIGNATURES (Name, Company, Date, Time):

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: L. Kelly Terracore 11/6/15 1:10

Received By: Shawn Robinson AS 11/6/15 1:10

TURNAROUND

Organic, Metals & Inorganic Analysis

Standard

10	5	3	2	1	SAME DAY
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Fuels & Hydrocarbon Analysis

*Turnaround request less than standard may incur Rush Charges



Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EVIS110106

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Date 11/16/15 Page 9 Of 10

NWTPH-HCID
NWTPH-DX
NWTPH-GX
BTEX by EPA-8021
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260
Halogenated Volatiles by EPA 8260
Volatile Organic Compounds by EPA 8260
EDB / EDC by EPA 8260 SIM (water)
EDB / EDC by EPA 8260 (soil)
Semi-volatile Organic Compounds by EPA 8270
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>
PCBs <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082
Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>
Metals Other (Specify)
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>
OTHER (Specify)
NUMBER OF CONTAINERS
RECEIVED IN GOOD CONDITION?

Handwriting practice sheet featuring a grid pattern. The top row contains the sequence: - 8 8 8 8 8 8 8 8 8.

The middle section features a decorative horizontal band consisting of a repeating series of 'X' marks formed by intersecting diagonal lines.

SIGNATURES (Name, Company, Date, Time):

SIGNATURES (Name, Company, Date, Time):	TURNAROUND REQUESTED in Business Days*	OTHER:
<i>[Signature]</i> 11/16/15 1:10		

Received By: _____

2. Relinquished By: _____

Received By: -

*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

(423) 330-2020
<http://www.alsglobal.com>

Date 11/16/15 Page 10 Of 10

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, ~~Date~~ Time):

1. Relinquished By: Shawly Robinson 11/16/13 1:10
Received By: Shawly Robinson 11/16/15 1:10pm

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*
OTHER: Organic, Metals & Inorganic Analysis

Fuels & Hydrocarbon Analysis

Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

*Turnaround request less than standard may incur Rush Charges



December 28, 2015

Mr. Chad Kean
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Kean,

On December 21st, 1 sample was received by our laboratory and assigned our laboratory project number EV15120171. The project was identified as your BA158014. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	12/28/2015
		ALS JOB#:	EV15120171
		ALS SAMPLE#:	EV15120171-01
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/18/2015 2:00:00 PM
CLIENT SAMPLE ID	Concrete, Soil Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	1.6	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	105	12/23/2015	GAP
DCB	EPA-8082	119	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 12/28/2015
ALS SDG#: EV15120171
WDOE ACCREDITATION: C601

CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY BLANK RESULTS

MBLK-12232015 - Batch R266900 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1221	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1232	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1242	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1248	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1254	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1260	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1268	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 12/28/2015
ALS SDG#: EV15120171
WDOE ACCREDITATION: C601
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R266900 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	72.0			12/23/2015	GAP
PCB-1016 - BSD	EPA-8082	79.0	9		12/23/2015	GAP
PCB-1260 - BS	EPA-8082	93.0			12/23/2015	GAP
PCB-1260 - BSD	EPA-8082	100	7		12/23/2015	GAP

APPROVED BY

Laboratory Director



ALS Job# (Laboratory Use Only)

ALS Job# (Laboratory Use Only)

(425) 356-2626
<http://www.alsglobal.com>

(425) 356-2626
<http://www.alsglobal.com>

Of_

ANALYSIS REQUESTED	OTHER (Specify)
NWTPH-HCID	
NWTPH-DX	
NWTPH-GX	
BTEX by EPA-8021	
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input checked="" type="checkbox"/>	
Halogenated Volatiles by EPA 8260	
Volatile Organic Compounds by EPA 8260	
EDB / EDC by EPA 8260 SIM (water)	
EDB / EDC by EPA 8260 (soil)	
Semivolatile Organic Compounds by EPA 8270	
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input checked="" type="checkbox"/>	
Pest Pesticides <input checked="" type="checkbox"/> by EPA 8081/8082	
Metal-MTCAs-5 <input type="checkbox"/> RCPA-8 <input type="checkbox"/> Pt Pol <input type="checkbox"/> TAL <input type="checkbox"/>	
Metals Other (Specify)	
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>	
NUMBER OF CONTAINERS _____	
RECEIVED IN GOOD CONDITION? _____	

[illegible]

SIGNATURES (Name, Company, Date, Time):

TURNAROUND
Organic, Metals & Inorganic Analysis
10 5 3 2 1 SAME DAY
Standard
Fuels & Hydrocarbon Analysis

OTHER: per national
Specify: account plan

Standard	5	3	1	SAME DAY
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* Turnaround request less than standard may incur Rush Charges



December 28, 2015

Mr. Chad Kean
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Kean,

On December 21st, 8 samples were received by our laboratory and assigned our laboratory project number EV15120172. The project was identified as your BA158014. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 12/28/2015

ALS JOB#: EV15120172

ALS SAMPLE#: EV15120172-01

CLIENT CONTACT: Chad Kean

DATE RECEIVED: 12/21/2015

CLIENT PROJECT: BA158014

COLLECTION DATE: 12/17/2015 11:00:00 AM

CLIENT SAMPLE ID CS-16-2'

WDOE ACCREDITATION: C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	114	12/23/2015	GAP
DCB	EPA-8082	118	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	12/28/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15120172
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15120172-02
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/17/2015 11:10:00 AM
CLIENT SAMPLE ID	CS-16-4'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	106	12/23/2015	GAP
DCB	EPA-8082	122	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	12/28/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15120172
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15120172-03
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/18/2015 1:14:00 PM
CLIENT SAMPLE ID	NS-2-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	115	12/23/2015	GAP
DCB	EPA-8082	119	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	12/28/2015
		ALS JOB#:	EV15120172
		ALS SAMPLE#:	EV15120172-04
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/18/2015 1:41:00 PM
CLIENT SAMPLE ID	NS-2-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	121	12/23/2015	GAP
DCB	EPA-8082	123	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	12/28/2015
		ALS JOB#:	EV15120172
		ALS SAMPLE#:	EV15120172-05
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/17/2015 3:33:00 PM
CLIENT SAMPLE ID	NS-3-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	129	12/23/2015	GAP
DCB	EPA-8082	128	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	12/28/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15120172
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15120172-06
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/17/2015 4:15:00 PM
CLIENT SAMPLE ID	NS-3-3.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	127	12/23/2015	GAP
DCB	EPA-8082	133	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	12/28/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15120172
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15120172-07
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/18/2015 12:00:00 PM
CLIENT SAMPLE ID	NS-9-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	89.0	12/23/2015	GAP
DCB	EPA-8082	96.0	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	12/28/2015
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV15120172
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV15120172-08
CLIENT CONTACT:	Chad Kean	DATE RECEIVED:	12/21/2015
CLIENT PROJECT:	BA158014	COLLECTION DATE:	12/18/2015 1:05:00 PM
CLIENT SAMPLE ID	NS-9-3.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	MG/KG	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	112	12/23/2015	GAP
DCB	EPA-8082	118	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

DATE: 12/28/2015
ALS SDG#: EV15120172
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBLK-12232015 - Batch R266900 - Soil by EPA-8082

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1221	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1232	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1242	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1248	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1254	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1260	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP
PCB-1268	EPA-8082	U	MG/KG	0.10	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 12/28/2015
ALS SDG#: EV15120172
WDOE ACCREDITATION: C601
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R266900 - Soil by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	72.0			12/23/2015	GAP
PCB-1016 - BSD	EPA-8082	79.0	9		12/23/2015	GAP
PCB-1260 - BS	EPA-8082	93.0			12/23/2015	GAP
PCB-1260 - BSD	EPA-8082	100	7		12/23/2015	GAP

APPROVED BY

Laboratory Director



ALS Job# (Laboratory Use Only)

(+23) 000-2020
<http://www.alsglobal.com>

Date 12/21/15 Page 1 Of 1[illegible]

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. CS-16-2'	12/17/15	11:00	Soil	1
2. CS-16-4'	12/17/15	11:10		2
3. NS-2-2'	12/18/15	13:14		3
4. NS-2-3'	12/18/15	13:41		4
5. NS-3-2'	12/17/15	15:33		5
6. NS-3-3.5'	12/17/15	16:15		6
7. NS-q-2'	12/18/15	12:00		7
8. NS-q-3.5'	12/18/15	13:05	X	8
9.				
10.				

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: S. Yeh Terrace 12/21/15 9:30
Received By: Wally Webb, ACS, 12/21/15 9:30

2. Relinquished By: _____

Received By: _____

Standard
10
5
3
2
1
SAME DAY

Standard	5	3	1	SAME DAY
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

OTHER: per national
Specify: plan account

*Turnaround request less than standard may incur Rush Charges



December 23, 2015

Mr. Chad Kean
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Kean,

On December 21st, 1 sample was received by our laboratory and assigned our laboratory project number EV15120173. The project was identified as your BA158014. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 12/23/2015

ALS JOB#: EV15120173

ALS SAMPLE#: EV15120173-01

CLIENT CONTACT: Chad Kean

DATE RECEIVED: 12/21/2015

CLIENT PROJECT: BA158014

COLLECTION DATE: 12/18/2015 4:48:00 PM

CLIENT SAMPLE ID Water Drum

WDOE ACCREDITATION: C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1221	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1232	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1242	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1248	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1254	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1260	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP
PCB-1268	EPA-8082	U	0.10	1	UG/L	12/23/2015	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TCMX	EPA-8082	106	12/23/2015	GAP
DCB	EPA-8082	110	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 12/23/2015
ALS SDG#: EV15120173
WDOE ACCREDITATION: C601
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY BLANK RESULTS

MBLK-12232015 - Batch R266833 - Water by EPA-8082

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
PCB-1016	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1221	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1232	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1242	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1248	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1254	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1260	EPA-8082	U	UG/L	0.10	12/23/2015	GAP
PCB-1268	EPA-8082	U	UG/L	0.10	12/23/2015	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
DATE: 12/23/2015
ALS SDG#: EV15120173
WDOE ACCREDITATION: C601
CLIENT CONTACT: Chad Kean
CLIENT PROJECT: BA158014

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R266833 - Water by EPA-8082

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
PCB-1016 - BS	EPA-8082	55.0			12/23/2015	GAP
PCB-1016 - BSD	EPA-8082	62.0	12		12/23/2015	GAP
PCB-1260 - BS	EPA-8082	79.0			12/23/2015	GAP
PCB-1260 - BSD	EPA-8082	81.0	3		12/23/2015	GAP

APPROVED BY

Laboratory Director



ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV15120173

Date 12/21/15 Page 1 Of 1

PROJECT ID: BA158014				ANALYSIS REQUESTED										OTHER (Specify)																			
REPORT TO COMPANY: Terracon				MTBE by EPA-8261 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>										TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>																			
PROJECT MANAGER: Chad Kean				BTEX by EPA-8021										Metals Other (Specify)																			
ADDRESS: 21995 64th Ave W Ste. 200				NMTPH-GX										Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pti Pol <input type="checkbox"/> TAL <input type="checkbox"/>																			
ADDRESS: Mountlake Terrace, WA 98043				NMTPH-DX										Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>																			
PHONE: 425-771-3304 FAX: E-MAIL: cdkean@terracon.com				NMTPH-HCID										PCB <input checked="" type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 808/808																			
P.O. #:				Halogenated Volatiles by EPA 8260										Semi-volatile Organic Compounds by EPA 8270																			
INVOICE TO COMPANY:				Volatile Organic Compounds by EPA 8260										EDB / EDC by EPA 8260 SIM (water)																			
ATTENTION: Same				EDB / EDC by EPA 8260 (soil)										EDB / EDC by EPA 8260 SIM (water)																			
ADDRESS:				Standard										Fuels & Hydrocarbon Analysis																			
SAMPLE I.D.				DATE										TIME																			
TYPE				LAB#										RECEIVED IN GOOD CONDITION?																			
1. Water Drum				12/21/15										16:48 Water										1									
2.																																	
3.																																	
4.																																	
5.																																	
6.																																	
7.																																	
8.																																	
9.																																	
10.																																	

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Chad Kean Terracon 12/21/15 9:30
- Received By: Chad Kean, ALS, 12/21/15, 9:30am
2. Relinquished By: _____
- Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis

Specify: 10 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis

Specify: 5 3 1 SAME DAY

OTHER: account plan

*Turnaround request less than standard may incur Rush Charges

**APPENDIX D – Terracon - PCBs Concrete and Soil Sampling
Work Plan and Sampling and Analytical Plan dated October
7, 2015**

PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

October 7, 2015
UW Project No. 204350
Terracon Project No. BA158014

Prepared for:
University of Washington
Seattle, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

Offices Nationwide
Employee-Owned

Established in 1965
terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

October 7, 2015



University of Washington
Capital Projects Office
Box 352205
Seattle, WA 98195-2205

Attn: Mr. Shane Ruegamer

Re: PCBs Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan

North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington
UW Project No. 204350
Terracon Project No. BA158014

Terracon Consultants, Inc. is pleased to submit this Work Plan and Sampling and Analytical Plan for the Polychlorinated Biphenyls (PCBs) Concrete and Soil Sampling activities proposed within the basement level transformer room portions of the north, south, and central towers at McCarty Hall at the above referenced site.

We appreciate the opportunity to perform these services for the University of Washington. Please contact the undersigned if you have questions regarding the information provided in the work plan and sampling and analysis plan.

Sincerely,
Terracon Consultants, Inc.

A blue ink signature of Chad Kean, consisting of a stylized 'C' followed by a series of loops and a horizontal stroke.

Chad Kean, CIH, CHMM, CPSWQ
Project Manager II

A blue ink signature of Michael D. Noll, featuring a large, sweeping 'M' and 'D' followed by a series of loops and a horizontal stroke. Below the signature is a small blue ink mark that looks like the letters 'for'.

Michael D. Noll, LG, LHG
Senior Project Manager

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APPENDICES

Appendix A

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Appendix B

Dames & Moore - Closure Report PCB Remediation - June 1997

1.0 Introduction

On behalf of the University of Washington, Terracon Consultants, Inc. (Terracon) has prepared this Polychlorinated Biphenyls (PCBs) Concrete and Soil Sampling Work Plan and Sampling and Analytical Plan for assessing the extent of PCBs in the concrete floor and underlying pea gravel fill as a result historical releases of PCBs that were reported to the Washington Department of Ecology (Ecology) and United States Environmental Protection Agency (EPA) Region 10 in 1995. PCBs, and in particular Arochlor 1260, were detected on the concrete floor surface, in the concrete floor, and in the pea gravel fill beneath the concrete floor in 1995 in the basement level transformer room portions of the north, south, and central towers at McCarty Hall. In addition, portions of the concrete floor and underlying pea gravel in the north and central tower electrical rooms were removed for offsite disposal in 1996, during the replacement of the transformers.

1.1 Site Vicinity Description

The site is located in the North portion of the University of Washington campus. McCarty Hall is comprised of a north, south and central tower. The site is bounded to the north by Northeast 45th Street and to the east, south, and west by additional University of Washington facilities. The location of the site is illustrated in Figure 1.

1.2 Summary of Previous Work

Dames & Moore completed a Closure Report PCB Remediation at the site in June 1997. As part of the investigation, site characterization was conducted in the transformer rooms between November 1994 and March 1995 to determine the nature and extent of PCB contaminated material resulting from the transformer oil leaks or spills. The results of the site characterization indicated that PCBs were present in all three transformer rooms at McCarty Hall exceeding regulatory action levels under the Toxics Substance Control Act (TSCA). Please see the Dames & Moore report included as Appendix B for reference, for further information regarding the initial site characterization and remedial activities.

Dames & Moore conducted remedial activities in the north, south, and central tower transformer rooms in McCarty Hall between July and December 1996. Remedial activities included removal, disposal and/or replacement of the transformers and electrical appurtenances containing PCBs; washing and rinsing of PCB contaminated concrete surfaces; scabbling and encapsulating of the washed PCB contaminated concrete surfaces; removal of PCB contaminated concrete slabs and underlying soils; confirmatory sampling and analysis during and following removal or decontamination activities; and waste disposal.

**PCBs Concrete and Soil Sampling Work Plan and Sampling
and Analytical Plan**

North Campus Student Housing - McCarty Hall ■ Seattle, Washington
October 7, 2015 ■ Terracon Project No. BA158014



In the north tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slabs and underlying soils. During the initial investigation, five core samples were collected from the concrete floor. One core sample contained 390 milligrams per kilogram (mg/kg) of PCBs. The concrete floor slabs located in the northeast corner and south-central portion of the electrical room were removed and replaced. Following the concrete floor slab removal, one soil sample was collected at approximately seven inches below ground surface (bgs) and contained 1.6 mg/kg PCBs. A total of four wipe sample were collected prior to the slab removal and, based on the wipe sample results (PCBs concentrations ranged from 7 to 470 $\mu\text{g} / 100\text{cm}^2$), portions of the floor slab were either removed or encapsulated. In addition, in the non-encapsulated areas, the floors were washed and rinsed and an additional four wipe samples were collected. Based on the results of the final wipe samples, (the results ranged from less than 1 $\mu\text{g} / 100\text{cm}^2$ to 35 $\mu\text{g} / 100\text{cm}^2$), no further remedial action was completed in those areas.

In the south tower transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, and encapsulation using an epoxy-based paint. A total of 12 post-cleanup surface wipe samples were collected from the concrete floor surface, with results ranging from less than 1 microgram per 100 square centimeters ($\mu\text{g} / 100\text{cm}^2$) to 35 $\mu\text{g} / 100\text{cm}^2$. Based on the wipe sample results, the surfaces were then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan and red from the top to bottom.

In the central transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slabs and underlying soils. During the initial investigation, seven concrete cores and six sub-slab pea gravel samples were collected at depths ranging up to 2.4 feet bgs. Two concrete core samples and two pea gravel samples contained PCBs at concentrations above 10 mg/kg. The concrete floor in the east portion of the electrical room was removed and replaced, along with the underlying pea gravel to depths up to approximately 39 inches bgs. In west portion of the room, the floor was scabbled. Based on the results of three post-scabbling wipe samples (all less than 10 $\mu\text{g} / 100\text{cm}^2$), no further remedial action was completed on the electrical room floor. In addition, the east half of the north wall of the electrical room was washed and rinsed. Two final wipe samples were collected from the electrical room wall. Based on the results (both less than 10 $\mu\text{g} / 100\text{cm}^2$), no further remedial action was completed on the electrical room wall.

In the hallway areas outside of the central transformer room, remedial activities included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of a portion of the concrete slab. Based on the results of the initial investigation and follow-up sampling, it was decided that portions of the surrounding hallway would either be washed and rinsed, encapsulated, or removed. Based on the sampling results, the slab

in the doorway of the fan room was removed and replaced, and the remainder of the impacted hallway concrete floor area was encapsulated.

1.3 Standard of Care

Terracon's services will be performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of this work plan and sampling and analysis plan, or in any subsequent reports. Our services will be performed in accordance with the scope of work agreed to by our client, as reflected in our executed task order, and were not restricted by ASTM E1903-11.

Findings, conclusions and recommendations resulting from our services are based upon information derived from the on-site activities and other services performed under our scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this investigation. Subsurface conditions may vary from those encountered at specific borings or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for contaminants in connection with a property. Completion of the activities proposed in this work plan and sampling and analysis plan is intended to reduce, but not eliminate, uncertainty regarding the existence of contaminants in connection with the subject property.

1.4 Reliance

This work plan and sampling and analysis plan is certified to, can be relied upon by, and has been prepared for the exclusive use of the University of Washington and regulatory agencies having jurisdiction over the site. Reliance on this work plan and sampling and analysis plan and subsequent reports by the client and all authorized parties will be subject to the terms, conditions and limitations stated in our proposals, reports, and Argus Pacific's Master Agreement for Regulated Building Materials and Engineer Services with the University of Washington.

2.0 Investigation Objectives

The overall objectives of the PCBs concrete and soil sampling work plan and sampling and analysis plan at McCarty Hall are outlined in the following sections.

2.1 Project Objectives

The primary objective of this project is to assess PCBs in concrete and underlying pea gravel fill at McCarty Hall in each of the hall tower transformer rooms. Specifically, the proposed work will include conducting sampling of concrete floors and walls in each of the hall tower transformer rooms, along with sampling of the underlying pea gravel fill, to assess current PCB levels and document the extents of PCB contamination. Following completion of the sampling work, Terracon will produce a report documenting our findings.

2.2 Data Quality Objectives

The overall QA/QC objectives of this work plan and sampling and analysis plan are to outline procedures for the collection and assessment of data that are within acceptable ranges of precision, accuracy, representativeness, completeness, and comparability (PARCC) to meet the project Data Quality Objectives (DQOs). The DQOs associated with environmental data are a function of the sampling rationale and the procedures used to collect the samples, as well as the analytical methods and instrumentation used. However, uncertainty cannot be eliminated entirely from environmental data.

Details regarding the sampling rationale, procedures, and analytical methods are provided in Sections 4.0 through 5.0 of this work plan and sampling and analysis plan. Information with respect to field and laboratory quality assurance and quality control checks is provided in Sections 6.0 and 7.0.

The DQOs for this investigation will be used to provide environmental data of sufficient quantity and quality to support an evaluation of the extent of historical PCB releases to the concrete floor and underlying pea gravel fill associated with the electrical transformers and appurtenances located in the basement areas of the north, south, and central towers.

2.3 Regulatory Standards/Guidelines

PCBs and PCB-contaminated materials are regulated by the EPA under the Toxic Substances Control Act (TSCA), 40 CFR Part 761 and also by Ecology under the Model Toxics Control Act (MTCA). Based on the previous work conducted at the site by Dames & Moore, which was conducted under TSCA and reviewed by EPA Region X, it was

determined that Terracon's additional work will also be conducted under TSCA and submitted to the EPA for review and comment.

3.0 Physical Setting

Brief descriptions of regional and local topographic and hydrogeologic settings associated with the site are presented in this section.

3.1 Site Geology and Hydrogeology

Soils types observed during Dames & Moore's sub slab investigation at the site (Dames & Moore / Closure Report PCB Remediation 1997) consisted of pea gravel (probable slab underlayment) to the maximum depth explored (39 inches). No indications of groundwater were observed during Dames & Moore's investigation. Please see the Dames & Moore report Included as Appendix B for reference for further information regarding the regional and local geology and hydrogeology.

4.0 Concrete and Soil Sampling Strategy and Rationale

Described in this section are the sampling strategies that will be employed to meet the project and data quality objectives stated above, as well as the rationale behind the selection of sample locations and analytical methods.

Concrete sampling of the floor slabs and walls will be completed using a rotary hammer and bit to produce pulverized samples of the concrete. Terracon proposes to collect 40 full-depth samples from the floor slabs and 10 full-depth samples from the walls throughout the hall transformer rooms and surrounding areas. Soil sampling will be conducted by utilizing a stainless steel hand auger to collect samples of the underlying pea gravel fill/soils.

4.1 Concrete Sampling

Concrete samples will be collected utilizing a rotary hammer and bit to produce pulverized samples of the concrete. One discrete full-depth sample from each location shown in Figures 1-4 will be collected for laboratory analysis. Concrete samples will be submitted to ALS Analytical Group (ALS) in Everett, Washington, for PCB analysis by EPA Method 8082, in accordance with the procedures outlined in Section 6.0 below.

The results of these analyses will be used to assess the extent and levels of PCB contamination in the concrete floors and walls of the three electrical rooms at the site.

4.2 Soil Sampling

Following completion of each of the 40 concrete corings discussed in Section 4.1 above, a discrete soil sample will be collected for laboratory analysis from directly beneath the floor slab using a clean stainless steel hand auger. In addition, at one location in each of the transformer rooms additional soil samples will be collected at approximately two and four feet below the top of the floor to evaluate the deeper underlying pea gravel fill/soils for PCB impacts. Soil samples will be submitted to ALS for PCB analysis by EPA Method 8082, in accordance with the procedures outlined in Section 6.0 below.

The results of these analyses will be used to assess the extent and levels of PCB impacts in the pea gravel fill/soils beneath the electrical room concrete floors at the site.

5.0 Field Methods and Sampling Procedures

The following section provides detailed information regarding the methods and procedures that will be used to conduct the additional site characterization.

5.1 Pre-mobilization Activities

Prior to conducting intrusive activities, several critical tasks will be performed to ensure compliance with applicable regulatory requirements and to minimize the potential risk associated with rotary hammering and subsurface sampling.

EPA Review – This concrete and soil sampling work plan and sampling and analysis plan will be submitted to EPA Region 10 for review and approval.

Underground Utility Clearance - No later than four days prior to mobilization, Terracon project personnel will clearly mark or stake the proposed exploration locations and contact Underground Services Alert (USA) to obtain information regarding underground utility or service lines in the proposed work area. Terracon will obtain a USA ticket number for the project that will be included in the field notes associated with the investigation. Terracon will additionally contract for the services of a private utility locating service to survey the proposed exploration locations to identify utilities and/or underground structures that may be impacted as part of this project.

5.2 Pre-Construction Meeting

Terracon will schedule an on-site pre-construction meeting with the University of Washington to discuss the proposed intrusive activities within the structure. The topics covered in the pre-construction meeting are as follows:

- Discuss worker safety with regard to the proposed work.
- Identify and/or locate all utilities that will be within the limits of the proposed exploration areas.
- Discuss the proposed duration of the project from start to finish, and any anticipated building worker/resident disruptions.
- Discuss proposed shutdowns of any live electrical equipment to facilitate the sampling.
- Identify any issues with returning the damaged interior portions of the structure to original and/or near original condition, as applicable.

5.3 Health and Safety

A site-specific Health and Safety Plan (HASP) has been prepared for this investigation and will be implemented by all field personnel and project management. All field personnel are required to read and understand the HASP prior to the initiation of work. In addition, a daily tailgate safety meeting will be conducted by the Terracon site safety officer each day prior to the start of field activities.

5.4 Sampling Activities

Based on the surface and subsurface conditions and fill/soil types present at the site, it is anticipated that the all concrete drilling and sampling activities will be conducted using a rotary hammer and bit, and that all soil samples will be collected using a clean stainless steel hand auger.

Concrete Sampling – Concrete samples will be collected using a rotary hammer and bit to produce pulverized samples of the concrete. Bit size will vary by location but will be between 1-4 inches in diameter. The drill bit will be placed within a dust collection shroud attached to a High Efficiency Particulate Air (HEPA) filter equipped vacuum cleaner to control fugitive dust. In addition, a HEPA filter equipped air scrubber will also be placed adjacent to the sample location to help control fugitive dust. Concrete samples will be collected into 4-oz glass jars using clean stainless steel scoops.

Soil Sampling – Following completion of the sampling of the concrete floor slabs, pea gravel fill/soil samples will be collected from directly beneath the concrete floor using a clean stainless steel 2.5-inch diameter hand auger. In addition, at one location in each of the electrical transformer rooms, additional soil samples will be collected at approximately two and four feet below the top of the floor to evaluate the deeper underlying pea gravel fill/soils for PCB impacts. During hand auger soil sampling, a HEPA filter equipped air scrubber will also be placed adjacent to the sample location to help control fugitive dust, and a HEPA filter equipped vacuum cleaner will be available to deal with any spoils on the concrete floor

surface. A new 4-inch PVC pipe will be used as a conductor pipe to facilitate hand auguring to the required depths for each of the two and four foot sample locations. Soil samples will be collected into 4-oz glass jars using clean stainless steel scoops.

Pea gravel fill/soil spoils generated during hand auguring will be contained within the investigation derived waste (IDW) drums that will be temporarily stored onsite, pending characterization for off-site disposal. All sample locations will be patched using concrete quick patch and new clean pea gravel will be used to fill soil boring to the bottom of the slab.

5.5 Decontamination Procedures

Decontamination of non-disposable sampling equipment will be performed prior to sampling and in between sample locations to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. All non-disposable sampling equipment utilized will be decontaminated by washing with a non-phosphate detergent, such as Liquinox™, Alconox, or equivalent, followed by a distilled water rinse. Decontamination water will be collected in drums onsite.

5.6 Sample Handling Procedures

The following subsections provide details regarding the sample handling procedures that will be followed for this investigation. These include sample labeling, packaging, and shipping procedures.

Labeling - Sample labels are necessary to prevent misidentification of samples. Sample labels will be filled out in indelible black or blue ink and affixed to sample containers at the time of sample collection. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection
- Sampler's initials
- Analyses required

Packaging and Shipping - Immediately after sample labeling, sample containers will be bagged in a resealable plastic bag to protect the samples from moisture and to prevent breakage and potential cross-contamination during transportation to the laboratory. All glass sample containers will be protected with bubble wrap if transported by a commercial carrier. The temperature of the samples will be recorded by the laboratory on the Chain of Custody (COC) record immediately upon receipt of the samples.

Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage. Samples transported by a laboratory-assigned courier will be packed in a sample cooler with sufficient ice to keep the samples cooled.

5.7 Sample Documentation

The following subsections provide details regarding the sample documentation procedures that will be followed for this investigation. These include preparation of Chain of Custody Forms and documentation of field notes.

Chain of Custody (COC) - To establish the documentation necessary to trace sample possession from the time of collection through analysis and disposal, a COC record will be completely filled out and will accompany every sample. Samples will be delivered to the laboratory for analysis as soon as practical. A COC record will accompany all samples. At a minimum, the following items will be recorded on the COC record:

- Project name
- Project location/Site ID
- Project number
- Sample ID
- Sampler name
- Date (of sample collection)
- Time (of sample collection to the nearest minute, 24-hour clock)
- Sample type (matrix)
- Number of sample containers
- Analyses required
- Comments
- Observations specific to sample
- The sampler will be the first person to relinquish sample possession
- Courier/laboratory representative signature
- Date/time (of custody transfer)

Field Logbooks/Notebooks - In order to maintain the integrity and traceability of samples, all information pertinent to field sampling will be recorded in a field logbook or field notebook. All samples will be properly labeled and packaged prior to being transported to the laboratory and will be accompanied by completed COC documentation. All documentation will be recorded in the field logbook or notebook in indelible black or blue ink. At the end of each workday, the logbook/notebook pages will be signed by the responsible sampler and any unused portions of the logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the logbook will contain the following information:

- Project name and site location
- Date and time
- Personnel in attendance
- General information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Descriptions of deviations from this work plan and sampling and analysis plan
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the samples

5.8 Investigation Derived Waste

Two drums of investigation-derived waste (IDW) including one 30-gallon concrete/soil and one 16-gallon water drum will be stored at the site for this project. Decontamination water will be generated during the sampling activities performed during this investigation and will be placed in the 16-gallon water drum stored on site.

The drums will be clearly labeled with the following information:

- Contact information for Terracon Consultants
- Date (day that accumulation of drum contents was initiated)
- Media type (concrete/soil spoils, decontamination water)
- Disposition (non-hazardous, pending analysis)

The IDW drums will be disposed in conjunction with the PCB contaminated concrete and soil, which will be conducted under a separate specification/work plan.

6.0 Analytical Strategy

This section outlines the analytical methods, sample containers, preservative requirements, and field quality control (QC) samples for this investigation.

6.1 Analytical Methods

The following analytical methods will be used to analyze soil and groundwater samples for this project:

- PCB analysis by EPA Method 8082.

Detailed information on methods and calibration criteria is provided in Section 7.0.

6.2 Sample Containers, Preservatives, and Holding Times

Concrete, soil and decontamination water samples will be placed in clean glassware provided by the laboratory. Each soil sample will comprise of one 4-ounce clear glass jar. Each decontamination water sample will comprise one 1-liter amber bottle without preservative. Hold times for PCB analysis of concrete/soil and water are 7 days to extract and then 40 days to analyze.

6.3 Field Quality Control Samples

Field QC samples will be collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples for this project will consist of five concrete duplicates and a single equipment blank. Field QC samples will be analyzed for PCBs using EPA Method 8082.

The field duplicates will consist of two distinct concrete samples (an original and a duplicate) from the same sample location collected at the same time to the extent practical and using the same sampling techniques. The field duplicate data will be used to evaluate the precision of the overall sample collection and analysis processes. Due to the heterogeneous nature of the soil matrix, field duplicate samples of soil will not be collected.

Field duplicates are uniquely identified so that the identity of the field duplicates is "blind" to the analytical laboratory. Locations of field duplicate samples and their identifications will be recorded in the field notes.

The equipment blank will be prepared by pouring a sample of deionized water over or through decontaminated field sampling equipment prior to the collection of environmental samples. The equipment blank will be stored with the other samples and analyzed by the laboratory for PCBs by the same method used for the other samples.

Equipment blanks are used to assess the adequacy of the decontamination process. They assess contamination from the total sampling, sample preparation and measurement process, when decontaminated sampling equipment is used to collect samples. Equipment blanks must be prepared using the same type of containers as the field samples.

7.0 Analytical Quality Control Procedures

This section describes laboratory qualification, sample custody and documentation, QC procedures, QC samples, preventative maintenance, data review, and deliverables for the collection of samples for chemical analysis.

7.1 Qualifications of Analytical Laboratory

The analytical laboratory selected to analyze samples for this project will be certified by the Washington State Department of Ecology and through the National Environmental Laboratory Accreditation Program (NELAP) for all of the analytical methods required for the project. The selected laboratory for the project will be capable of providing the required turnaround times, project QC, and data deliverables required by this work plan and sampling and analysis plan.

7.2 Laboratory Quality Control Procedures

The analytical laboratory must have written standard operating procedures (SOPs) defining the instrumentation, instrumentation maintenance, tuning, calibration, method detection and RLs, QC requirements, blank requirements, and step-by-step procedures for each analytical method. The SOPs must be available to the analysts performing the work. The SOPs must meet or exceed the requirements of the analytical methods cited in this work plan and sampling and analysis plan. The laboratory must maintain logs of all activities that have an impact on the quality of the laboratory results.

Any portion of the method that is subcontracted by the laboratory to another laboratory or sent to another facility of the same network of laboratories must have the prior approval of the Terracon Project Manager.

The laboratory must maintain the instruments in working condition required by the methods specified for the analyses. Sufficient redundancy in equipment must be available in the laboratory to handle downtime situations. Method substitution because of instrumental failure will not be permitted without written approval from the Terracon Project Manager.

7.3 Laboratory Quality Control Samples

The following subsections outline the laboratory QC samples required by this project.

Calibration - All instruments and equipment must be calibrated in accordance with the specified methods, unless different instructions are included in this document. Each instrument must be calibrated with the standard solutions appropriate to the type of instrument and the calibration range established for the method.

Initial calibrations (ICALs) should be performed when the method is first used and again whenever the continuing calibrations fail to meet their respective acceptance criteria. In addition, if the instrument undergoes significant maintenance, the ICAL must be repeated. Continuing calibrations verify that the instrument performance has remained within the limits set at the time of the ICAL. The frequency of continuing calibrations is specified in referenced methods.

Instrument/Calibration Blanks - Instrument blanks are run to ensure that analytes from previous runs have been purged out of the system and do not contaminate succeeding runs. Instrument blanks must be run following calibration runs, before sample analyses are performed, and after samples containing high concentrations of potentially interfering materials are found.

Target analytes must not appear in the instrument blanks at concentrations greater than half the required RLs. If the laboratory consistently observes contaminants in the instrument blanks, the laboratory must investigate the source of the contamination and eliminate it, if possible.

Method Blanks (MB) - Method blanks are prepared in the same manner as the samples, using the same reagents and glassware as for samples. The purpose of the method blank is to ensure that the equipment and reagents used in preparing the samples are free of contaminants that could interfere with the analysis. The method blank must be prepared and analyzed for each batch of 20 project samples or less per matrix (aqueous and solid) type.

The method blank must not exhibit analytes at concentrations greater than half the required RLs. If contaminants are found that either contribute to the apparent concentration of a particular target analyte or interfere with the analysis, the analysis must be stopped, the source of contamination identified and corrected, and the analysis repeated. Contamination in the method blank above half the RLs will require that the entire associated batch of extracts or digestates be reprepared and reanalyzed. Hence, it is very important to make sure that no such contamination is present.

Laboratory Control Samples (LCS) - LCSs are pre-prepared and checked samples containing known concentrations of specific target analytes. LCSs can also be prepared by spiking known amounts of target analytes into a well-characterized blank matrix. The matrix must be analyte-free, laboratory reagent-grade water for water samples and clean sand or equivalent for soil samples.

The LCS is prepared and run at a frequency of one per 20 project samples per matrix with the associated samples, using the same reagents and volumes. If insufficient quantity of sample is available for MS/MSD, the LCS will be prepared and analyzed in duplicates

(LCSD). All analytes in the LCS must meet recovery criteria. If the criteria are not met, the entire batch of samples must be reprepared, together with a new LCS, and reanalyzed.

Matrix Spike and Matrix Spike Duplicate (MS/MSD) - The MS/MSD serves to determine whether matrix effects are affecting recoveries. For inorganic analyses, only a single MS is performed per batch. A MS/MSD is prepared by spiking a known amount of solution to two portions of a sample being run in a batch. Once the spike is added to the MS/MSD samples, these samples are carried through the complete sample preparation process along with the other samples in the batch. The MS/MSD recoveries are compared against each other and against the known amount of the spike.

From this data, both accuracy and precision can be determined. The laboratory will perform a MS/MSD at a frequency of one per 20 project samples per matrix. To prepare a project-specific MS/MSD, field personnel will collect additional sample volumes at a frequency of one per 20 samples. Field personnel will designate samples for MS/MSD analysis on the COC record.

APPENDIX A

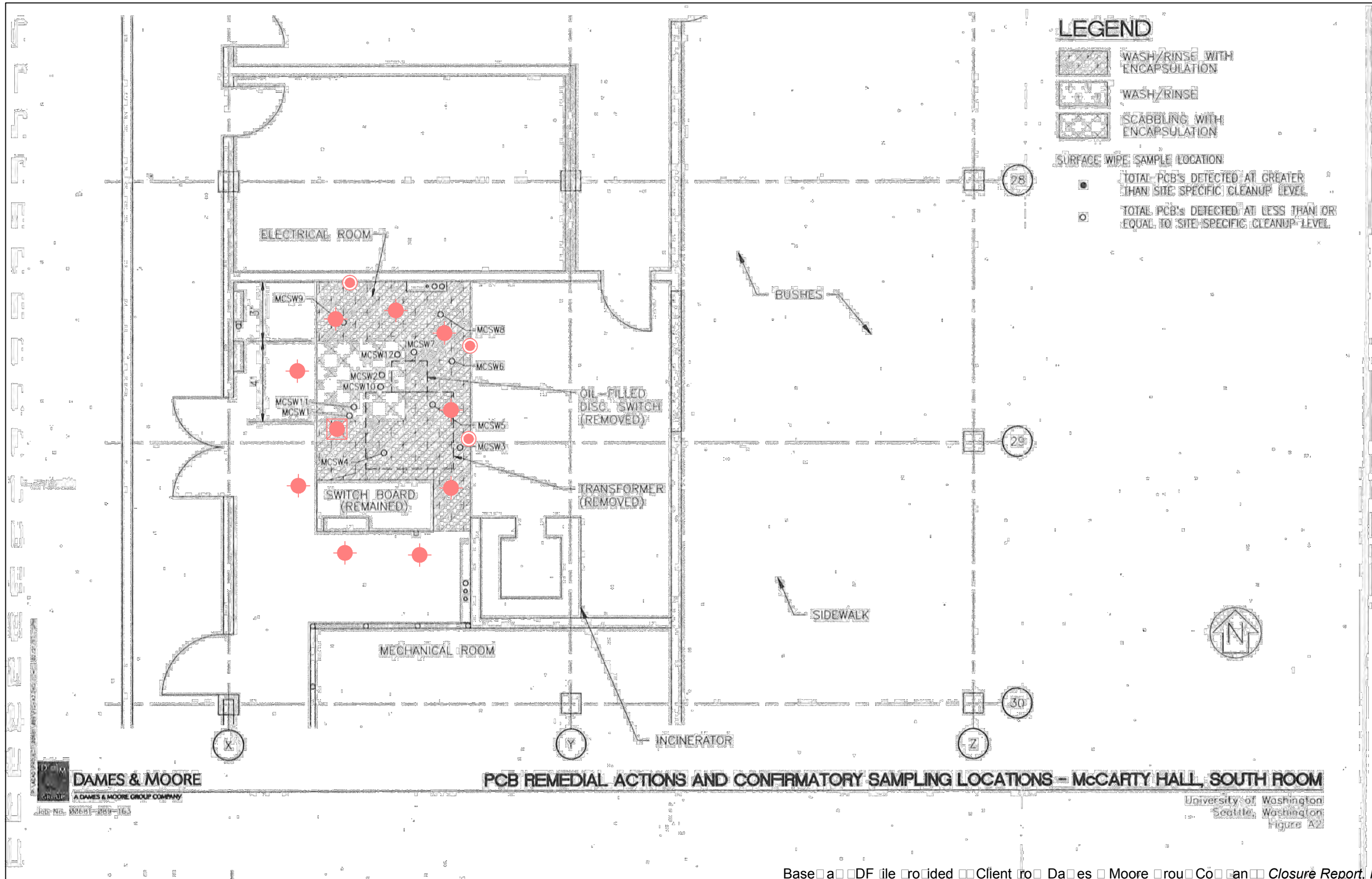
Figure 1: Site Location Map

Figure 2: Proposed Sample Locations – McCarty Hall - South

Figure 3: Proposed Sample Locations – McCarty Hall - North

Figure 4: Proposed Sample Locations – McCarty Hall - Central

Figure 5: Proposed Sample Locations – McCarty Hall - Central Hall



LEGEND:



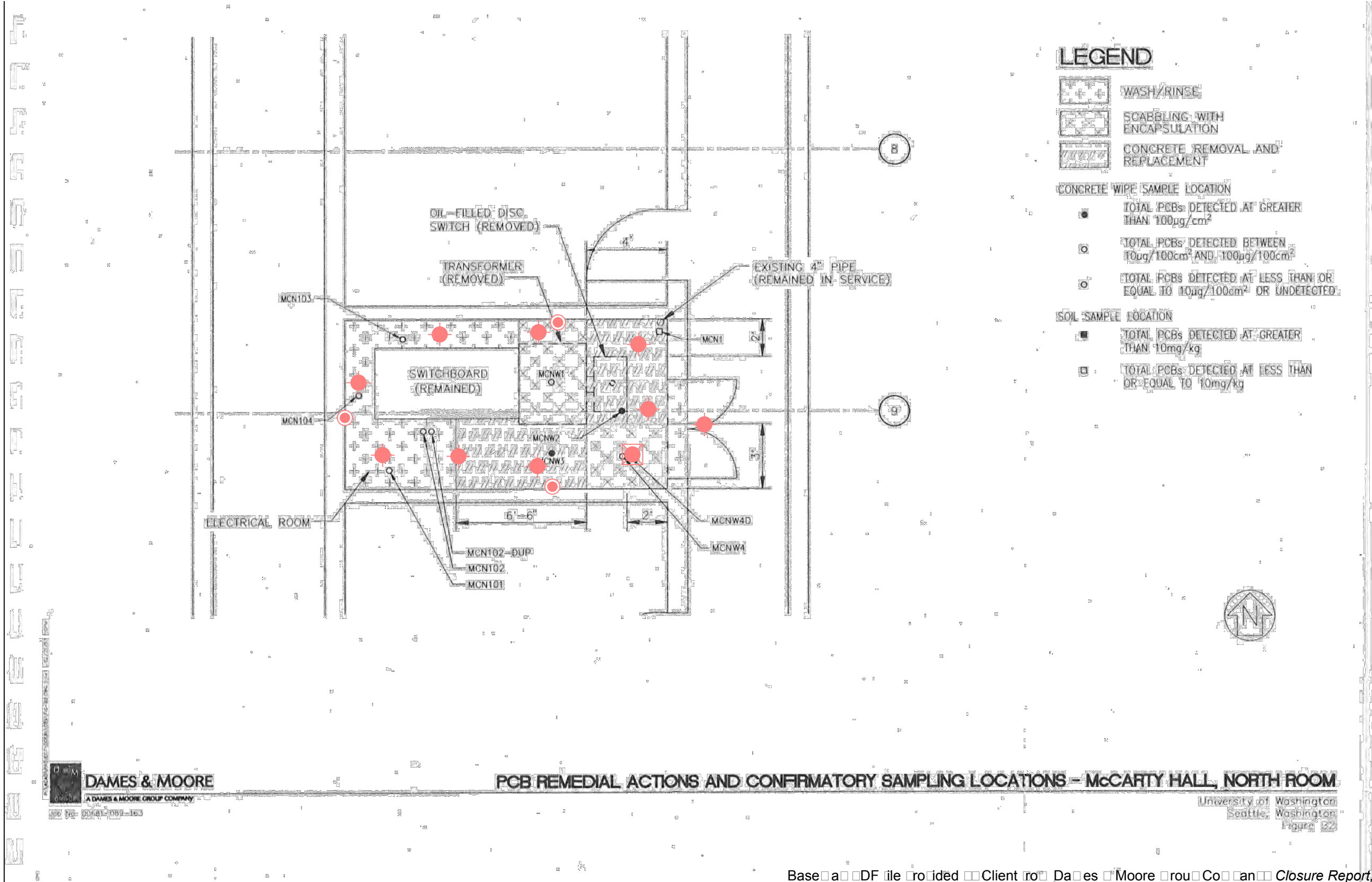
- ROOSED CONCRETE AND SUBSLAB SOIL SAMPLE LOCATION
- ROOSED CONCRETE MASONRY UNIT CMU WALL BLOCK SAMPLE LOCATION
- ROOSED CONCRETE AND DEE SUBSLAB SOIL SAMPLE LOCATION

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Checked By:	CDK	File No.	*.dwg
Approved By:	MDN	Date:	October 2015

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Proposed Sample Location - McCarty Hall South
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington



LEGEND:

- ROOSED CONCRETE AND SUBSLAB SOIL SAMPLE LOCATION
- ROOSED CONCRETE MASONRY UNIT CMU WALL BLOCK SAMPLE LOCATION
- ROOSED CONCRETE AND DEE SUBSLAB SOIL SAMPLE LOCATION

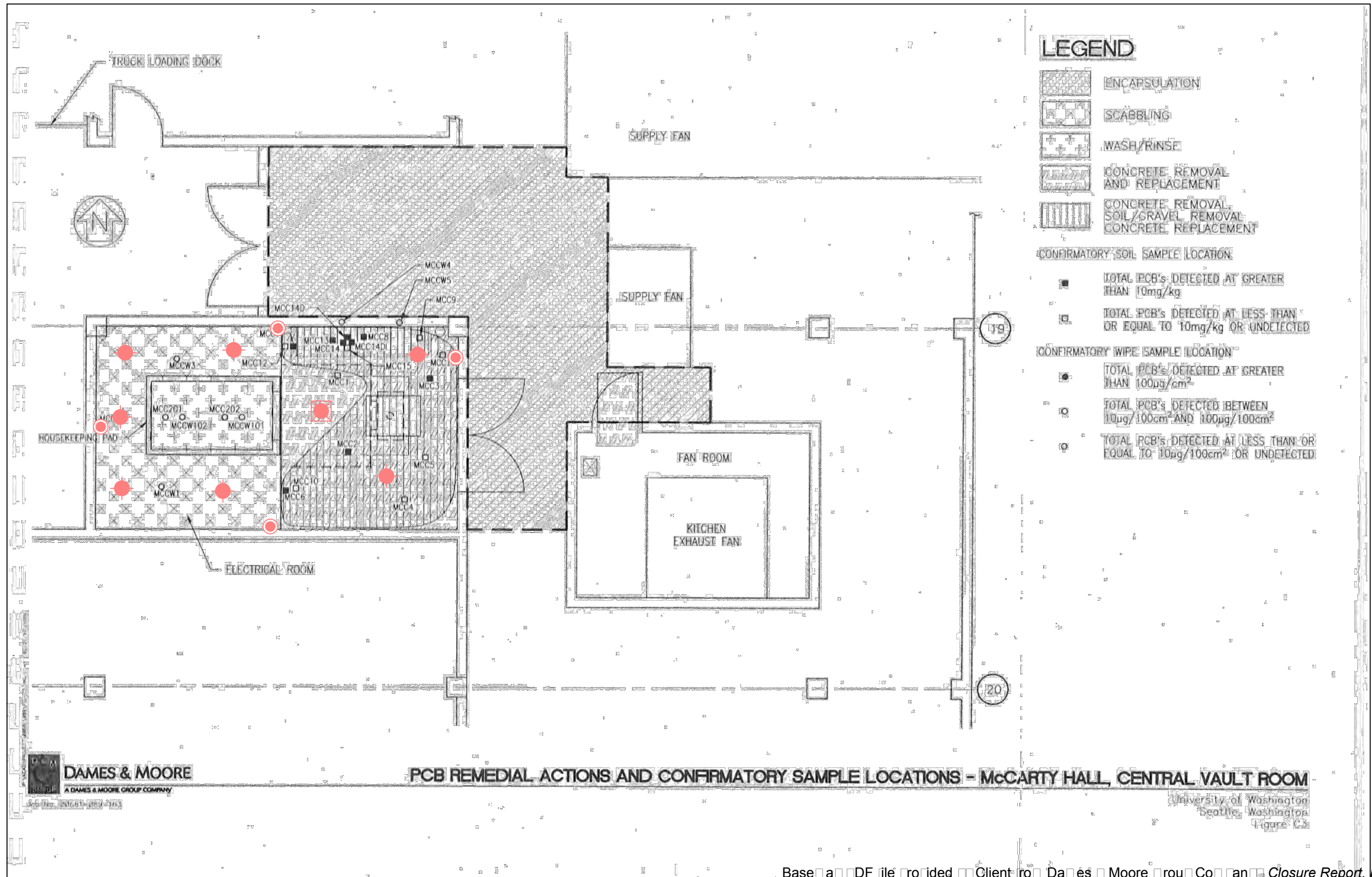
Project Mgr:	CDK	Project No.	BA158014
Drawn By:	AAS	Scale:	NOT TO SCALE
Checked By:	CDK	File No.	*.dwg
Approved By:	MDN	Date:	October 2015

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Proposed Sample Location	McCarty Hall North
North Campus Student Housing - McCarty Hall University of Washington Seattle, King County, Washington	


File No.
3

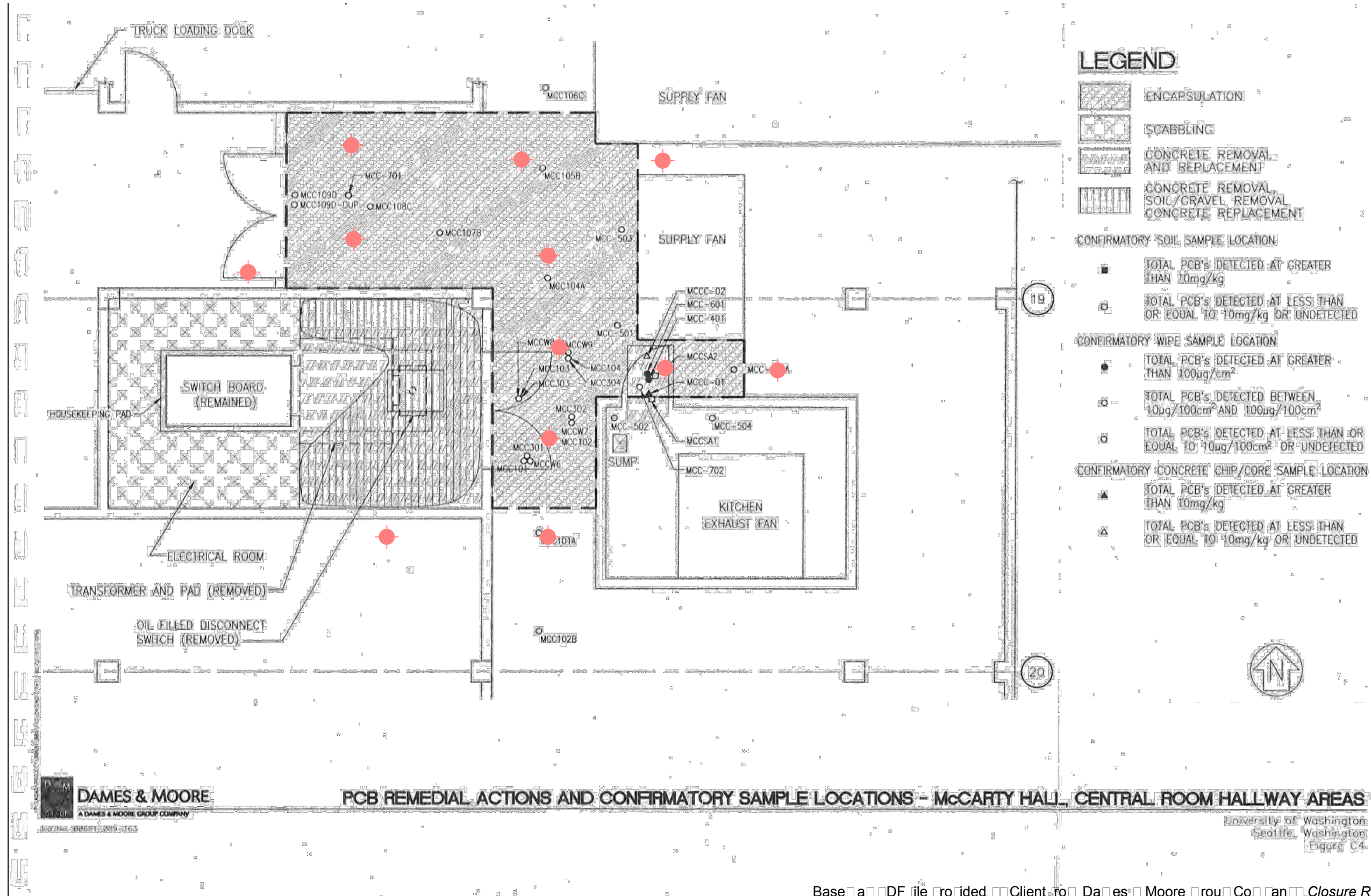


LEGEND:

- ROUSED CONCRETE AND SUBSLAB SOIL SAMPLE LOCATION
- ROUSED CONCRETE MASONRY UNIT CMU WALL BLOCK SAMPLE LOCATION
- ROUSED CONCRETE AND DEE SUBSLAB SOIL SAMPLE LOCATION

Base a DF file roided Client ro Da es Moore rou Co an Closure Report, PCB Remediation, McCarty Hall Transformer Vaults dated June 1 1997 and odified Terracon.

Project Mng: CDK		Project No. BA158014		 21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043 PH. (425) 771-3304 FAX. (425) 771-3549	Proposed Sample Location at McCarty Hall Central			File No. 4
Drawn By: AAS		Scale: NOT TO SCALE			North Campus Student Housing - McCarty Hall University of Washington Seattle, King County, Washington			
Checked By: CDK		File No. *.dwg						
Approved By: MDN		Date: October 2015						



LEGEND:



PROPOSED CONCRETE AND SUBSLAB SOIL SAMPLE LOCATION

Base map provided by Client to Dames & Moore for use in Closure Report, PCB Remediation, McCarty Hall Transformer Vaults dated June 1, 1997 and modified by Terracon.

Project Mgr:	CDK	Project No.	BA158014
Drawn By:	AAS	Scale:	NOT TO SCALE
Checked By:	CDK	File No.	*.dwg
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Proposed Sample Location - McCarty Hall - Central Area
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

File No.
5

APPENDIX B

Dames & Moore - Closure Report PCB Remediation - June 1997



DAMES & MOORE

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**CLOSURE REPORT
PCB REMEDIATION
MCCARTY HALL
TRANSFORMER VAULTS**

For

**UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON
UW PROJECT NO. 1873
D&M JOB NO.: 00681-089-163
June 18, 1997**



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June 18, 1997

Mr. Seth Mullen
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Closure Report
PCB Remediation
McCarty Hall Transformer Vaults
University of Washington
Seattle, Washington
UW Project No.: 1873
D&M Job No.: 00681-089-163

Dear Mr. Mullen:

Dames & Moore is pleased to submit four copies of the Final Closure Report for the PCB remediation of the McCarty Hall transformer vaults located at the University of Washington in Seattle, Washington.

The closure of the transformer vaults for McCarty Hall was conducted in accordance with the Toxics Substance Control Act (TSCA), Washington State's Model Toxics Control Act (MTCA) and the EPA-approved site-specific cleanup levels and remediation alternatives presented in the letter from the University of Washington to EPA Region 10 dated March 6, 1995. The analytical results indicated that site-specific cleanup levels have been achieved in the vaults. The PCB remedial actions are considered to be protective of human health and the environment; therefore, no further action is recommended.

We received comments from Seth Mullen on May 9, 1997 to the Draft Closure Report submitted to the University of Washington on February 28, 1997. We have incorporated those comments into Final Closure Report.



DAMES & MOORE

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University of Washington

June 18, 1997

Page 2

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We have appreciated the opportunity to work with you on this project. Please do not hesitate to call if you have any questions or require additional information.

Very truly yours,

DAMES & MOORE



Joanne Yan-Gwo

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Figure 1 - Site Vicinity Map

Figure 2 - Site Plan - McCarty Hall

APPENDICES

Appendix A - McCarty Hall South Transformer Vault Data Tables and Figures

Appendix B - McCarty Hall North Transformer Vault Data Tables and Figures

Appendix C - McCarty Hall Central Transformer Vault Data Tables and Figures

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**PCB REMEDIATION CLOSURE REPORT
MCCARTY TRANSFORMER VAULTS
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON**

EXECUTIVE SUMMARY

This report presents the results of a remedial action associated with three transformer vaults which were affected by polychlorinated biphenyls (PCBs). The three transformer vaults are located in McCarty Hall at the University of Washington in Seattle, Washington. Site characterization was conducted in the transformer vaults between November 1994 and March 1995 to determine the nature and extent of PCB contaminated material resulting from transformer oil leaks or spills. In addition, samples were collected for analysis of potential volatile organic compounds (VOCs) in the central vault. The results indicated that PCBs were present in all three transformer vaults. VOCs above regulatory cleanup levels were not identified.

Remedial activities were conducted in the south, north, and central transformer vaults in McCarty Hall between July and December 1996. Remedial activities included removal, disposal, and/or replacement of the transformers and electrical appurtenances containing PCBs; washing and rinsing of PCB contaminated concrete surfaces; scabbling PCB contaminated concrete surfaces; removal of PCB contaminated concrete slabs and underlying soils; confirmatory sampling and analysis during and following removal or decontamination activities; and waste disposal.

Concrete surfaces and underlying soils containing PCBs have been decontaminated and/or removed, encapsulated, and disposed. Institutional controls are recommended to maintain the integrity of the concrete floor encapsulation and to restrict public access.

The remedial action is considered to be protective of human health and the environment; therefore, no further action is recommended.

**PCB REMEDIATION CLOSURE REPORT
MCCARTY TRANSFORMER VAULTS
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON**

1.0 INTRODUCTION

This document serves as the closure report for a PCB remedial action conducted for three transformer vaults (south, north and central) at McCarty Hall which were affected by polychlorinated biphenyls (PCBs). McCarty Hall is located at the University of Washington in Seattle, Washington (Figure 1), and consists of a student activity center and two dormitory buildings located from south to north along the Whitman Court Road (Figure 2).

The McCarty Hall transformers were previously filled with transformer fluid containing PCBs and the central vault transformer was retrofilled with "TF-1" in the early 1990s. The Material Safety Data Sheet (MSDS) for TF-1 indicates that the primary constituents of TF-1 are trichlorobenzene and tetrachlorobenzene isomers. Site characterizations of south, north and central transformer vaults were conducted between November 1994 and March 1995 by Dames & Moore to determine the nature and extent of PCB and potential volatile organic compound (VOC) materials resulting from transformer oil leaks and spills. The results indicated that PCBs were presented in all three transformer vaults. VOCs above regulatory cleanup levels were not identified.

Dames & Moore prepared PCB remediation design drawings and specifications for south, north, and central transformer vaults in McCarty Hall in early 1996. Remedial activities were conducted between July and December 1996. This closure report summarizes the site characterization results, describes the remediation activities, and presents post remediation confirmatory sampling results in McCarty Hall transformer vaults.

2.0 SITE DESCRIPTION AND LOCATION

McCarty Hall is comprised of three main sections: the south, central, and north areas. McCarty Hall South and Central were constructed in 1960, and McCarty Hall North was added in 1962. McCarty Hall North and South can house a total of 594 students during an academic year. McCarty Hall Central serves as a student activity center and consists of conference rooms, a piano lounge, mailbox center, and a cafeteria.

The McCarty Hall transformer vaults are located in the basement of each building, kept locked at all times, and may only be accessed by authorized personnel. PCB warning labels have been placed on the doors of the mechanical or electrical rooms where PCB remediation has been conducted.

2.1 SOUTH TRANSFORMER VAULT

The McCarty Hall South transformer vault floor plan is presented in Appendix A (Figure A1). The room is a rectangular concrete area approximately 12 feet by 17 feet and contains a transformer and switchgear. A transformer is located in the middle of the room and is approximately 3.5 feet by 4 feet.

The walls of the transformer vault are constructed of 18-inch cinder block and extend from the floor to the ceiling on every side of the vault. The cinder block walls are topped with a 6-inch concrete curb and a locking door on the west side.

2.2 NORTH TRANSFORMER VAULT

The McCarty Hall North transformer vault floor plan is presented in Appendix B (Figure B1). The room is a rectangular concrete area approximately 8.5 feet by 16 feet and contains a transformer and switchgear. All electrical appurtenances in this vault are situated directly above concrete pad. A transformer is located in the middle of the room and is approximately 3.5 feet by 4 feet.

The walls of the transformer vault are constructed of 18-inch cinder block and extend from the floor to the ceiling on every side of the vault. The cinder block walls are topped with a six-inch concrete curb and a locking door on the east side. The vault room floor is a 4-inch thick concrete slab.

2.3 CENTRAL TRANSFORMER VAULT

The McCarty Hall Central transformer vault floor plan is presented in Appendix C (Figure C1). The room is a rectangular concrete area approximately 10 feet by 18 feet and contains a transformer and switchgear. All electrical appurtenances in this vault are situated directly above concrete pad. A transformer is located in the middle of the room and is approximately 3.5 feet by 4 feet.

The walls of the transformer vault are constructed of 18-inch cinder block and extend from the floor to the ceiling on every side of the vault. The cinder block walls are topped with a 6-inch concrete curb and a locking door on the east side. The vault room floor is a 4-inch-thick concrete.

3.0 GEOLOGY AND HYDROGEOLOGY

Many of the soil formations in the Puget Sound area of Washington are the result of glacial advances and recessions. Sediments deposited during glacial advance were densely compacted by the glacial ice. Glacial outwash and till, consisting of a dense, unsorted mixture of clay, silt, sand, gravel, and cobbles were deposited as the glacier receded. Occasionally, depressions formed in the ground surface during the recession. Lakes and ponds now occupy many of these depressions, some of which have been wholly or partially filled with silt or organic peat marsh deposits.

A geologic map and hydrogeologic information indicates the site and site vicinity is underlain by unconsolidated glacial till of Quaternary age designated the Vashon till. The till is generally up to 150 feet thick and consists of a hard, unsorted mixture of clay, silt, sand and gravel which may include interbedded lenses of sand and gravel.

The outcropping glacial till is relatively impermeable although thin beds of sand and gravel in the till commonly yield small quantities of perched or semiperched groundwater. Although groundwater flow direction data were not available, based on the local topography, regional groundwater flow is expected to be south to southwesterly toward Lake Union.

4.0 SUMMARY OF REGULATORY REQUIREMENTS

PCBs and PCB regulated materials are regulated under the Toxics Substance Control Act (TSCA) and under Washington State's Model Toxics Control Act (MTCA). VOCs are regulated under MTCA.

4.1 FEDERAL REGULATORY REQUIREMENTS FOR PCBs

PCBs and PCB-contaminated materials are regulated under TSCA, 40 CFR Part 761. Subpart G of 40 CFR 761 constitutes the PCB Spill Cleanup Policy and provides numerical cleanup levels for surfaces contaminated by PCBs. The cleanup standards are based on restricted and nonrestricted access areas, frequency of contact, and type of surface. The federal Spill Cleanup Policy numerical cleanup standards that are applicable to the McCarty Hall transformer vault remediation project are:

- 10 $\mu\text{g}/100\text{ cm}^2$ for all surfaces with high frequency of contact in a non-restricted access area
- 100 $\mu\text{g}/100\text{ cm}^2$ for porous surfaces with encapsulation with low frequency of contact in a restricted access area
- 10 $\mu\text{g}/100\text{ cm}^2$ for all smooth surfaces in a restricted access area
- 10 mg/kg for soil with low frequency of contact in a restricted access area

Spills of PCB containing materials that occurred prior to May 4, 1987, are excluded from the requirements of the PCB Spill Cleanup Policy. The policy states that spills that occurred before this date require evaluation on a site-by-site basis by the EPA Regional office, since old spills are generally more difficult to clean up than fresh spills; and older spills are generally more widespread than fresh spills.

Decontamination to below numerical cleanup levels must be verified by post-cleanup sampling performed in accordance with 40 CFR 761.130. The Spill Cleanup Policy also requires that any cleanup be documented, and that records of the cleanup be maintained for 5 years.

Subpart D of 40 CFR 761 sets standards for the storage and disposal of PCBs, including soil and debris. Under 40 CFR 761.60 (a)(4), any non-liquid materials containing PCBs in concentrations of 50 mg/kg and

greater, including soil, rags and other debris, must be disposed of either in an incinerator approved for handling PCBs or in an approved chemical waste landfill.

4.2 STATE REGULATORY REQUIREMENTS FOR PCBs

PCBs released to the environment are regulated by the State of Washington under the Model Toxics Control Act (MTCA, WAC-173-340). The PCB releases that have occurred in the transformer vaults are considered to be "historical" releases. The University met the State of Washington Department of Ecology representatives to discuss the applicability of MTCA to the remedial process. It was agreed that where releases to the environment had occurred, the University was not required to participate in the MTCA process because the remedial actions were being conducted under EPA's TSCA requirements (Appendix D). This decision is consistent with the provisions in MTCA under WAC 173-340-310 (4)(d)(iii).

4.3 SELECTION OF PCB CLEANUP STANDARDS

The cleanup levels selected for remedial action at McCarty Hall were based on the PCB Spill Cleanup Policy under TSCA. The vault was located in a room that was restricted to public access and kept locked except during maintenance and inspection activities. The concrete floors and cinder block and concrete walls within the vault were considered porous surfaces.

The University met with EPA Region 10 on February 16, 1995 to discuss the University's proposed PCB remediation approach for transformer conversion projects. The University received EPA Region 10 concurrence associated with the proposed site-specific cleanup levels and remediation alternatives. As a result of this meeting, the following cleanup levels were selected for the University's PCB transformer vault remediation projects (Appendix E):

- 10 $\mu\text{g}/100 \text{ cm}^2$ for all surfaces with high frequency of contact in a non-restricted access areas
- 100 $\mu\text{g}/100 \text{ cm}^2$ for porous surfaces (concrete surfaces) with encapsulation in restricted access areas
- 10 $\mu\text{g}/100 \text{ cm}^2$ for porous surfaces (concrete surfaces) without encapsulation in restricted access areas
- 10 $\mu\text{g}/100 \text{ cm}^2$ for equipment surfaces in a restricted areas
- 10 mg/kg for soils in restricted access areas

Regulatory concrete PCB cleanup levels are not available; therefore, the soil PCB cleanup level of 10 mg/kg was used for concrete.

4.4 VOLATILE ORGANIC COMPOUND CLEANUP STANDARDS

The McCarty Hall central vault transformer was retrofilled with "TF-1" in the early 1990s. Based on the MSDS, the constituents of TF-1 are diepoxide and volatile organic compounds (VOCs), including 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,3,4-tetrachlorobenzene, and 1,2,4,5-tetrachlorobenzene. Cleanup standards for these compounds were based on MTCA requirements. The MTCA Method B soil cleanup levels for the target VOCs are presented in Table C2 of Appendix C.

5.0 SITE CHARACTERIZATIONS

Site characterizations of the south, north, and central transformer vaults in McCarty Hall were conducted between November 1994 and March 1995 by Dames & Moore. The objectives were to 1) assess the lateral and vertical extent of PCB migration in areas identified as potential conduits; 2) evaluate the traffic areas on the floor surfaces leading to the vault entrance to see if they contained PCBs; 3) determine if remediation was necessary as part of transformer replacement; 4) determine if VOC remediation was necessary as part of transformer replacement; and 5) evaluate potential for contractor exposure during transformer removal to assist the University in determining use of proper personal protective equipment (PPE) and disposal methods.

The site characterizations were conducted by Dames & Moore in three phases. The first phase was conducted on November 28, 1994 and included the collection of surface floor wipe samples in limited switchgear areas and the collection of concrete chips samples. The second phase was conducted on December 21, 1994 and included the collection of surface wall wipes, additional floor surface wipes, concrete cores, and underlying soil samples. The third phase was conducted on March 25, 1995 and included collecting additional underlying soil samples from the central vault. The samples were analyzed for PCBs by EPA Method 8080 and the selected samples were analyzed for VOCs by EPA Method 8260. Results of the site characterization of each transformer vault are described in a report entitled "PCB Survey of McCarty Hall Transformer Vaults, June 12, 1995," and summarized in the following sections. The chain of custodies, letters of quality control and assurance, and laboratory results are also included in 1995 PCB survey report.

5.1 SOUTH TRANSFORMER VAULT

A total of 12 PCB wipe samples (MCS-01 through MCS-12) were collected from the floor surface of the south transformer vault (Appendix A, Figure A1). The analytical results are summarized in Appendix A (Table A1). Three samples (MCS-5, MCS-6, and MCS-8), located to the north and east of the transformer, contained PCB concentrations ranging from 11 $\mu\text{g}/100\text{ cm}^2$ to 580 $\mu\text{g}/100\text{ cm}^2$ which were above the 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level. The highest PCB concentration was located 2 feet north of the transformer.

5.2 NORTH TRANSFORMER VAULT

The site characterization in the north transformer vault included the collection of 21 concrete floor wipe samples, 5 interior concrete floor core samples, 3 exterior (nonrestricted access area) concrete floor wipe samples, 4 interior wall wipe samples, and 1 underlying soil sample (Appendix B, Figure B1). The analytical results are summarized in Appendix B (Table B1).

5.2.1 Interior Floor Surfaces

A total of 21 PCB wipe samples (MCN-01 through MCN-14, MCN-18 through MCN-22, and MCN-27 and MCN-27-dup) were collected from the floor surfaces of the north transformer vault to assess the lateral extent of PCB migration. Wipe sample results indicated that PCBs were present at all locations in concentrations ranging from 7.8 to 2,400 $\mu\text{g}/100\text{ cm}^2$. All PCB concentrations were above the 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level with the exception of PCB concentrations detected in samples MCN-9, MCN-11, and MCN-19. The highest PCB concentration was located directly underneath the transformer.

5.2.2 Interior Floor Concrete Cores

A total of 5 PCB concrete core samples (MCN-CC-01 through MCN-CC-05) were collected from the interior concrete floor in the north transformer vault to assess the vertical extent of PCB migration. Concrete cores 1½ inches in diameter and 2 inches in depth were drilled by personnel from the Concrete Coring Company of Kent, Washington, using a masonry drill equipped with a diamond-tipped coring bit. The concrete core samples were shipped to Analytical Resources Incorporated Laboratories (ARI) where a ¼-inch to ½-inch segment of each core was cut, crushed and analyzed. Sample MCN-CC-01 contained 390 mg/kg PCBs. The remaining samples did not detect PCBs (Appendix B, Table B1).

5.2.3 Walls

A total of 4 PCB wipe samples (MCN-23 through MCN-26) were collected from the wall surface of the north transformer vault (Appendix B, Figure B1). The samples were collected on the cinder block wall 0.45 feet from the vault floor. Three samples contained detectable PCB concentrations ranging from 0.6 to 3 $\mu\text{g}/100\text{ cm}^2$ which were below the cleanup level of 10 $\mu\text{g}/100\text{ cm}^2$ (Appendix B, Table B1).

5.2.4 Underlying Soils (Pea Gravel)

One pea gravel sample (MCN-SL-01-A-B) was collected at a depth of 1.5 feet below the concrete floor near the groundwire in the north transformer vault (Appendix B, Figure B1). PCBs were not detected in this soil sample (Appendix B, Table B1).

5.2.5 Unrestricted Access Area

A total of 3 wipe samples (MCN-15 through MCN-17) were collected from the concrete floors in the unrestricted access area outside the north transformer vault to determine the extent of PCB migration from personnel tracking (Appendix B, Figure B1). PCBs were detected at three wipe sample locations and ranged from a nondetected level to $1.9 \mu\text{g}/100 \text{ cm}^2$ which was below the cleanup level of $10 \mu\text{g}/100 \text{ cm}^2$ (Appendix B, Table B1).

5.3 CENTRAL TRANSFORMER VAULT

Site characterization activities at the McCarty Hall central transformer vault included the collection of 2 surface wipe samples from switchgear, 27 surface wipe samples from the interior concrete floor and transformer pad, 6 surface wipe samples from the exterior concrete floor surface, 4 surface wipe samples from the wall surface, 10 concrete chip or core samples from the interior vault floor, and 11 underlying soil samples. Sample locations are present in Appendix C (Figures C1 and C2). The analytical results are described below.

5.3.1 Switchgear

One wipe sample (MCC-01) was collected from the shelf inside the switchgear, and another wipe sample (MCC-02) was collected from the concrete floor at the base of the switchgear (Appendix C, Figure C1). Both samples contained PCB concentrations of 1,210 and $87 \mu\text{g}/100 \text{ cm}^2$, respectively, which were above the $10 \mu\text{g}/100 \text{ cm}^2$ cleanup level (Appendix C, Table C1).

5.3.2 Interior Floor Surfaces

A total of 25 PCB wipe samples (MCC-03 through MCC-21 and MCC-29 through MCC-34) were collected from the interior floor surface of the central transformer vault (Appendix C, Figure C1). Wipe sample results indicated that PCBs were present at all locations above the $10 \mu\text{g}/100 \text{ cm}^2$ cleanup level, with the exception of wipe samples MCC-29 located under the vault door entrance, and wipe sample MCC-32 located at the west end of the vault room (Appendix C, Table C1). The highest PCB concentration ($420,000 \mu\text{g}/100 \text{ cm}^2$) was located in the northeast corner of the vault room.

Two PCB concrete chip samples were collected from the expansion joint material of the interior concrete floor (CS-MCC-01) and from the cement block berm under the vault door of the central transformer vault (CS-MCC-02). Samples CS-MCC-01 and CS-MCC-02 contained 30 and 4,900 mg/kg PCBs, respectively, which were above the 10 mg/kg cleanup level (Appendix C, Table C1).

Two wipe samples were collected from the transformer pad surface (MCC-VOC-01) and the interior concrete floor (MCC-VOC-02) in the central transformer vault for VOC analyses (Appendix C, Figure C2). VOCs were either not detected or detected at trace levels (Appendix C, Table C2).

Two VOC concrete chip samples were collected from the transformer pad surface (CS-MCC-03) and the interior concrete floor (CS-MCC-04) in the central transformer vault (Appendix C, Figure C2). VOCs in both concrete chip samples were either not detected or detected at levels below the MTCA cleanup standards (Appendix C, Table C2).

5.3.3 Exterior Floor Surfaces

A total of 6 wipe samples (MCC-23 through MCC-28) were collected from the concrete floors in the egress area of the vault and from the maintenance room floor outside the central transformer vault (Appendix C, Table C1). PCBs were detected at all locations and ranged from 1.3 to 11.1 $\mu\text{g}/100\text{ cm}^2$. Only wipe sample MCC-26 at 11.1 $\mu\text{g}/100\text{ cm}^2$, and located 3 feet immediately to the east of the vault room door, contained a PCB concentration above 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level.

5.3.4 Interior Floor Concrete Cores

A total of 7 concrete core samples (MCC-CC-01 through MCC-CC-07) and one duplicate sample were collected from the interior concrete floor in the central transformer vault (Appendix C, Figure C1). PCBs were detected at all concrete core sample locations and ranged in concentration from 0.45 to 250 mg/kg PCBs (Appendix C, Table C1). Two samples (MCC-CC-01 and MCC-CC-06) and the duplicate (MCC-CC-01-dup), contained PCB concentrations above the 10 mg/kg cleanup level and were located on the east side of the vault room.

5.3.5 Walls

A total of 4 wipe samples (MCC-35 through MCC-38) were collected on the concrete walls of the central transformer vault. Only wipe sample MCC-35, at 14 $\mu\text{g}/100\text{ cm}^2$ and located approximately 7 inches from floor surface, contained a PCB concentration above the 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level.

5.3.6 Underlying Soils (Pea Gravel)

Ten underlying pea gravel samples and one field duplicate sample were collected beneath the central transformer vault (Appendix C, Figure C1). Pea gravel samples were collected at depths of up to 2.4 feet below the top of the gravel at each location in the vault room. PCBs were detected in 6 pea gravel samples and ranged from undetected to 650 mg/kg. Samples MCC-SL-01A-B and MCC-SL-01B contained PCB concentrations above the 10 mg/kg cleanup level (Appendix C, Table C1). The highest PCB concentration was located northeast of the transformer.

6.0 APPROACH TO CLEANUP

The University and Dames & Moore evaluated several remedial alternatives for removing and decontaminating PCB contaminated materials associated with the transformer vaults which would achieve site-specific cleanup standards. The remedial alternatives were described in a Dames & Moore report

entitled "PCB Survey of McCarty Hall Transformer Vaults" dated June 12, 1995. The evaluation included assessing remedial options associated with decontaminating and/or removing materials contaminated with PCBs, and encapsulation. The techniques are described below.

6.1 SOLVENT/DETERGENT WASHING

Solvent/detergent washing was considered an appropriate method to decontaminate PCBs on the concrete pad surface, floor surfaces in unrestricted public access areas, and floor surfaces in narrow spaces where scabbling is not feasible or physically inaccessible. This technique was considered where PCBs were detected above $10 \mu\text{g}/100 \text{ cm}^2$ on surfaces in unrestricted access areas. This method was also considered where concrete transformer pads contain localized "hot spots" rather than lateral and vertical PCB contamination. The effectiveness of washing is dependent on the surface condition, the extent of the affected area and the PCB concentration.

CAPSUR wash solvent was used during chemical cleaning of the concrete floor and wall surfaces. It is an aqueous based solvent with emulsifiers developed for the cleanup of PCBs spills on solid surfaces. Approximately 0.07 gallons of waste per square foot area cleaned is generated with each cleanup application. The residue contains approximately 75 percent water.

6.2 CONCRETE SCABBLING

Scabbling is an effective approach to removal of the PCB contamination on concrete surfaces. This method was considered where PCBs were detected in concrete core samples and where surface wipe sample concentrations of PCB concentrations above $100 \mu\text{g}/100 \text{ cm}^2$ were detected.

Scabbling consists of the dustless removal of a minimum of 1/16 inch from the floor surface using a diamond abrasive grinder and/or needle guns. The grinder and/or needle guns are equipped with dust shrouds and connected to a dust vacuum equipped with HEPA filters. The vacuum generates a negative air flow to minimize spreading of PCB contaminated dust.

6.3 ENCAPSULATION

Encapsulation was considered an appropriate remediation approach for surfaces where solvent detergent washing and scabbling remediation techniques cannot achieve site-specific cleanup levels. Encapsulation provides a layered protective coating over PCB contaminated surface to eliminate exposure routes. Sika epoxy coating bonds well to all common structural substrates, is resistant to chemicals and abrasion, and provides a durable, smooth finish that allows for easy wipe-off. Institutional controls are recommended with this approach since PCBs will remain in place and a potential exists that, with time, the coating may become damaged or decayed, allowing potential exposure of PCBs. The institutional controls may include routine integrity inspections of the coating and subsequent repair (if necessary), and postage of signs that indicate the presence of PCBs.

6.4 CONCRETE REMOVAL

Concrete removal was considered for surfaces where core samples indicated that the PCB concentration was above the cleanup level beyond the depth at which scabbling is effective, or where soil contamination above PCB cleanup levels was present.

Concrete removal was performed in a sealed environment with HEPA filtered fans providing a negative pressure ventilation of the space to prevent spreading of PCB contaminated dust. The areas to be removed were sawcut and then removed using mechanical methods.

6.5 SOIL REMOVAL

Soil removal was considered where PCBs above 10 mg/kg were detected in underlying soil samples. Following soil removal, confirmatory soil samples were collected. When soil sample results indicated PCB concentrations at levels below the cleanup standard of 10 mg/kg, soil removal was deemed complete.

6.6 SELECTED REMEDIAL APPROACH

McCarty Hall South, Central, and North transformer vaults are considered restricted access indoor vaults. The selected method of remediation for all PCB contaminated materials identified in McCarty Hall included:

- decontamination of concrete floor surfaces through mechanical or chemical cleaning methods
- removal of PCB contaminated concrete slabs and underlying soils
- encapsulation of the exposed concrete surfaces contaminated with PCBs at a level above 10 $\mu\text{g}/100\text{ cm}^2$ but less than 100 $\mu\text{g}/100\text{ cm}^2$
- confirmatory sampling and analysis
- disposal of all wastes generated from the cleaning and removal process in accordance with state and federal regulations

During decontamination and concrete surface removal activities, poly-sheeting was taped at the entrance door to completely seal the room. The vault was ventilated with a fan, and the air in the room was drawn under a negative pressure through HEPA and charcoal filters before venting outside. All wastes generated were contained in 55-gallon drums, 1-yard boxes, or bulk roll-off containers. Wastes were disposed of within 30 days after they were generated.

6.7 CONFIRMATORY SAMPLING

Confirmatory samples were collected after mechanical or chemical cleaning of the concrete floor surfaces to determine compliance with site-specific cleanup standards. Wipe samples were collected in accordance with the sampling procedure and handling protocols for wipe samples as described in 40 CFR 761.130

and the applicable EPA guideline documents (Verification of PCB Spill Cleanup by Sampling and Analysis and Wipe Sampling and Double Wash/Rinse Cleanup as recommended by the EPA Spill Cleanup Policy).

6.8 SUPPLIER INFORMATION

CAPSUR Wash Solvent:	Supplier Name:	Integrated Chemistry, Inc.
	Supplier Address:	1970 Oakcrest Avenue, Suite 215 St. Paul, MN 55113
	Supplier Phone:	(612) 636-2380
Epoxy Sealant:	Supplier Name:	Atlas Supply
	Supplier Address:	1736 4th Avenue South Seattle, WA 98134
	Supplier Phone:	(206) 623-4697

7.0 REMEDIAL ACTION

The University contracted with Amaya Electric to remove and replace the south, north and central transformers. Alcan Environmental was a subcontractor of Amaya Electric hired to perform transformer removal, PCB remediation, and PCB disposal. Alcan hired Envirotech Systems, Inc. to arrange for PCB transportation and disposal. Wastes generated during remediation were manifested and transported to various disposal facilities in Oregon, Kentucky, Ohio, Texas, and Utah. Dames & Moore collected confirmatory samples following decontamination and/or the removal of concrete surfaces and underlying soils. Copies of laboratory reports and chain of custodies are presented in Appendix F. The remedial action was conducted between July and December 1996.

7.1 REMEDIATION OF SOUTH TRANSFORMER VAULT

PCB remediation in the south transformer vault included decontamination of concrete surfaces by washing and rinsing, scabbling, and encapsulation. The remedial actions and confirmatory sample results are described below. PCB remedial actions and wipe sample locations in the south transformer vault are summarized in Appendix A (Figure A2). The analytical results are summarized in Appendix A (Table A2).

7.1.1 Removal and Encapsulation of Vault Room Concrete Surface

In August 1996, Alcan scabbled the top 1/8-inch of a 4-foot by 4-foot section of concrete floor located to the northwest of the former transformer. The concrete surface was removed using a blastrak machine.

Two wipe samples (MCSW1 and MCSW2) were collected from the concrete scabbled area. The analytical results indicated a PCB concentration of 23 $\mu\text{g}/100\text{ cm}^2$ at sample location MCSW-2 which was greater

than 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level. Based on these results, the surfaces were then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan and red from top to bottom.

7.1.2 Decontamination of Concrete Surface

In August 1996, Alcan decontaminated the concrete floor surfaces immediately north, east, and directly under the transformer in the south transformer vault by washing and rinsing. The area of decontamination is presented in Appendix A (Figure A2). Decontamination activity included washing all exposed areas with CAPSUR wash solvent and rinsing with water to remove PCB contamination. The washing and rinsing process was conducted three times.

After washing and rinsing the PCB contaminated surfaces, 10 surface wipe samples (MCSW3 through MCSW12) were collected (Appendix A, Figure A2). Two samples (MCSW4 and MCSW5) located on the footprint of the former transformer, contained PCBs at levels below 100 $\mu\text{g}/100\text{ cm}^2$ but above the 10 $\mu\text{g}/100\text{ cm}^2$ cleanup level (Appendix A, Table A2). Based on these results, the surfaces were then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan, and red from top to bottom.

7.2 REMEDIATION OF NORTH TRANSFORMER VAULT

PCB remediation in the north transformer vault included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slabs and underlying soils. The remediation actions and confirmatory sample results are described below. PCB remedial actions and wipe sample locations in the north transformer vault are summarized in Appendix B (Figure B2). The analytical results are summarized in Appendix B (Table B2).

7.2.1 Removal and Encapsulation of Vault Room Concrete Surface

Concrete removal in the north transformer vault included scabbling $\frac{1}{8}$ inch of the concrete floor surface and the removal of a 4-inch concrete floor slab (Appendix B, Figure B2). The floor surfaces located immediately north and directly below the former transformer and southeast corner of vault were scabbled by Alcan using a blastrak machine. The concrete floor slabs located in the northeast corner and south center of the vault room were removed using a concrete saw and a large jack hammer.

On August 21, 1996 one soil sample (MCN1) located 7 inches below ground surface (bgs) was collected (Figure B2). Sample MCN1 contained 1.6 mg/kg PCBs which was below the 10 mg/kg cleanup level. Soil removal was terminated and a new concrete slab was installed.

Four surface wipe samples (MCNW1 through MCNW4) and one field duplicate sample (MCNW4D) were collected on the concrete scabbled area. Samples MCNW1 and MCNW4D contained 11 $\mu\text{g}/100\text{ cm}^2$ PCBs. The area on top of the former transformer pad was then encapsulated with three coats of epoxy paint. The three layers were color coded in gray, tan, and red from top to bottom.

Two samples (MCNW2 and MCNW3) contained PCB concentrations above 100 $\mu\text{g}/100\text{ cm}^2$. Based on these results, the concrete slabs in the locations of sample MCNW2 and MCNW3 were removed.

7.2.2 Decontamination of Concrete Surface

In September 1996, Alcan decontaminated the surfaces of the concrete floor west of the former transformer (Figure B2). Decontamination activity included washing all exposed areas with CAPSUR wash solvent and rinsing with water to remove PCB contamination. The washing and rinsing was completed three times.

Four surface wipe samples (MCN101 through MCN104) and one field duplicate sample (MCN102-DUP) were collected after washing and rinsing of the PCB contaminated surface. All samples contained PCB concentrations below the cleanup standard of 10 $\mu\text{g}/100\text{ cm}^2$.

7.3 REMEDIATION OF CENTRAL TRANSFORMER VAULT

PCB remediation in the central transformer vault included decontamination of concrete surfaces by washing and rinsing, scabbling, encapsulation, and removal of concrete slab and underlying soil. The remediation actions and confirmatory sample results are described below. PCB remedial actions and wipe sample locations in the central transformer vault are summarized in Appendix C (Figures C3 and C4). The analytical results are summarized in Appendix C (Tables C3 and C4).

7.3.1 Removal of Concrete Slab and Underlying Soil

In July 1996, Alcan began removing the 4-inch concrete floor slab and underlying soils in the eastern portion of the vault room. The concrete slab to be removed was 9 feet by 10 feet. The underlying soils were removed to a depth of 8 inches bgs.

The soil under the concrete slab was light gray pea gravel which typically slumps to an angle of repose of about 45 degrees when it is not supported. In order to excavate this type of soil, Alcan had to shore the material to keep it in place using a 4-foot wood shoring box.

Between August 7 through August 14, 1996 nine soil samples (MCC1 through MCC9) were collected at various depth from 8 to 24 inches bgs. Five soil samples (MCC2, 3, 6, 7, and 8) contained PCB concentrations above the cleanup standard of 10 mg/kg. Soils in the area of samples MCC2, MCC3, and MCC6 were further removed to a depth of 20 inches bgs. Two soil samples (MCC10 and MCC11) were then collected at the bottom of the excavations. The analytical results indicated that both sample contained PCB concentrations below the cleanup standard of 10 mg/kg.

During the course of soil removal activity, pea gravel sloughed from beneath the concrete masonry unit (CMU) wall and adjoining floor slab to a distance greater than 2 feet. According to an inspection by

Dames & Moore's geotechnical engineer, the pea gravel extends to an indeterminable depth, and further excavation would result in the danger of structural instability of the adjoining walls and floor slabs.

PCB contaminated soils in the area of samples MCC7 and MCC8 were further removed to a depth of 26 inches bgs. Two soil samples (MCC12 and MCC13) were collected at the bottom of the excavations. Sample MCC13 contained 48 mg/kg PCBs, which was still above the 10 mg/kg cleanup level. Underlying soils in the area of sample MCC13 were further removed to a depth of 34 inches bgs. Three soil samples (MCC14 through MCC14D1) were collected at the bottom of the excavation. The analytical results indicated PCB concentrations ranging from 15 to 190 mg/kg. A metal shoring box was installed to allow for excavation to a greater depth.

Additional soil was then removed to a depth of 39 inches bgs, and soil sample MCC15 was collected at the bottom of the excavation. The analytical results indicated the PCB concentration was below the cleanup standard of 10 mg/kg. Soil removal was terminated, the excavated areas were backfilled, and a new concrete slab was installed.

7.3.2 Removal of Concrete Floor Surface

Alcan scabbled the top 1/8-inch of concrete from the floor surface in the western portion of the vault room. The concrete was removed using a blastrak machine.

Three surface wipe samples (MCCW1 through MCCW3) were collected in the western portion of the vault room after scabbling was completed. All samples contained PCB concentrations at levels below the cleanup standard of 10 $\mu\text{g}/100 \text{ cm}^2$.

7.3.3 Decontamination of Wall Surface

Alcan decontaminated the CMU wall surface by washing and rinse. The area of decontamination was between the floor elevation and 2 feet above that elevation for approximately 9 feet of the east half of the north wall section. Decontamination activity included washing all exposed areas with CAPSUR wash solvent and rinsing with water to remove PCB contamination. The wash and rinse procedure was conducted three times.

On August 28, 1996, two wipe samples (MCCW4 and MCCW5) were collected from the decontaminated area. All samples contained PCB concentrations at levels below the cleanup standard of 10 $\mu\text{g}/100 \text{ cm}^2$.

7.3.4 Decontamination of the Switchgear

On September 7, 1996 Alcan decontaminated the surfaces of the bottom metal frame inside the switchgear using CAPSUR wash solvent. The washing and rinsing process conducted three times. The area of decontamination was approximately 3 feet by 6 feet. Two surface wipe samples (MCCW101 and MCCW102) were collected on the same day after washing and rinsing were completed. Sample MCCW102, which was located next to the former transformer, contained PCB concentrations above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

On September 25, 1996 Alcan washed and rinsed inside the switchgear again. Following washing and rinsing, two surface wipe samples (MCC201 and MCC202) were collected on the same day (Appendix C, Figure C4). PCB concentrations were below the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

7.3.5 Additional Site Characterization and Remedial Actions in Hallway Areas

Following an initial remediation conducted in the hallway area, additional concrete surfaces containing PCBs above the established cleanup levels were identified during the confirmatory sampling and analysis. PCB-containing concretes were either decontaminated or removed and disposed of. The hallway area was encapsulated. This section provides the chronological description of remediation activities conducted in the hallway area.

Alcan decontaminated the concrete floor surface in front of the vault room in the restricted hallway. The decontamination activity included washing all exposed areas with CAPSUR wash solvent and rinsing with water to remove PCB contamination. The washing and rinsing process was conducted three times.

On August 28, 1996, four surface wipe samples (MCCW6 through MCCW9) were collected from the area in front of the vault room door after washing and rinsing the PCB contaminated surface. Two samples (MCCW7 and MCCW8) located in front of the vault room door in the restricted hallway, contained PCB concentrations (32 and $14 \mu\text{g}/100 \text{ cm}^2$, respectively) above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

On September 23, 1996, an additional 4 surface wipe samples (MCC101 through MCC104) were collected in the same area and all samples contained PCBs above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

On September 26, 1996 Alcan decontaminated the concrete surface in front of the vault room door for the second phase with CAPSUR wash solvent. The washing and rinsing process was conducted three times. Following the washing and rinsing, four surface wipe samples (MCC301 through MCC304) were collected on the same day. Three samples contained PCB concentrations above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$. This suggested that the wash and rinse procedure was not effective in removing PCB contamination from the floor surface at this location. The floor was encapsulated.

On October 8, 1996, 10 additional samples (MCC101A through MCC109D) were collected in the restricted hallway outside the central transformer vault (Appendix C, Figure C4). The objective was to assess if additional tracking of the PCB contamination from inside the vault room had occurred. The samples were collected sequentially along pathways from the vault room to the adjacent mechanical room along the hallway leading to McCarty Central's loading dock. Samples MCC101A and MCC104A, which located near the identified contaminated area, were first analyzed for PCBs. Sample MCC104A contained a PCB concentration ($23 \mu\text{g}/100 \text{ cm}^2$) above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

Two wipe samples (MCC105B and MCC107B), located adjacent to MCC104A were then analyzed and found to contain 6.9 and $15 \mu\text{g}/100 \text{ cm}^2$ PCBs, respectively. Sample MCC108C was then analyzed and contained $5.7 \mu\text{g}/100 \text{ cm}^2$ PCBs.

To assess the extent of PCB contamination through tracking, an additional two surface wipe samples (MCC-401 and MCC-402A) were collected in front of the fan room located east of the central transformer vault on October 25, 1996. Sample MCC-401 contained an elevated PCB concentration of $430 \mu\text{g}/100 \text{ cm}^2$. On December 7, 1996 Alcan scabbled the top $\frac{1}{8}$ -inch of concrete from the floor surface within a 1 foot radius of the location of sample MCC-401. On December 9, 1996 one surface wipe sample MCC-601 was collected in the middle of the scabbled area, and the result indicated a PCB concentration of $990 \mu\text{g}/100 \text{ cm}^2$, well above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$.

On December 13, 1996 an additional two concrete chip samples (MCCC-01 and MCCC-02) were collected at the north and south ends of the scabbled area. Sample MCCC1 contained a PCB concentration ($4,200 \text{ mg/kg}$) above the cleanup standard of 10 mg/kg . Based on these analytical results, the concrete slab in the doorway of fan room was removed. On January 21, 1997, two soil samples (MCCSA1 and MCCSA2) were collected after the concrete slab was removed. Both samples contained PCBs at levels below the cleanup level of 10 mg/kg . A new concrete slab was installed at the same location (Appendix C, Figure C4).

On November 5, 1996 an additional four surface wipe samples (MCC 501 through MCC 504) were collected (Appendix C, Figure C4). Two samples (MCC 502 and MCC 504) were collected in the fan room, and other two samples (MCC 501 and MCC 503) were collected along the walking track from fan room to the hallway. Only sample MCC 503 contained $11 \mu\text{g}/100 \text{ cm}^2$ PCB concentration, which is above the cleanup standard of $10 \mu\text{g}/100 \text{ cm}^2$. The entire hallway area was encapsulated with three coats of epoxy paint. On March 4, 1997, two wipe samples (MCC-701 and MCC-702) were collected from the encapsulated surfaces in the hallway area. PCBs were not detected in these samples.

8.0 INSTITUTIONAL CONTROLS

The University has established an institutional control program to restrict access to the vault (signs are posted) and to maintain the integrity of the encapsulated surfaces as follows:

- 1) The areas in the vault where concrete was removed or scabbled were encapsulated with three layers of color-coded paint (from top to bottom) in the colors of gray, tan, and red. Annual visual inspections of these painted areas will be conducted to identify and repair areas where the paint has eroded to maintain the integrity of the epoxy encapsulation paint. If any yellowing of the encapsulation paint is observed during these inspection, a fresh layer (or touch up) of yellow epoxy encapsulation paint will be applied immediately followed by a fresh layer of gray epoxy encapsulation paint. If the red layer of the encapsulation paint is observed, a fresh layer or touch up of red, yellow, and gray will be applied.
- 2) Access is restricted to the vault rooms by a locked door to allow only University maintenance personnel entrance to the vault rooms.
- 3) A sign will be posted inside the room that reads as follows: "This room is the site of a hazardous waste cleanup operation. Polychlorinated Biphenyl (PCB) contamination has been encapsulated beneath the floor. The paint on the floor is color coded. Should any yellow or red paint be exposed, notify Environmental Health & Safety (EH&S) (543-9510) immediately. Do not remove any of the floor without first obtaining approval from EH&S."

9.0 WASTE MANAGEMENT

This section details the waste removal, transport, and disposal methods for wastes generated during the PCB remediation at McCarty Hall. PCB contaminated wastes generated during McCarty Hall remediation were managed as TSCA waste. The waste manifest forms and certificates of disposal are presented in Appendix G.

Envirotech Systems, Inc., a licensed hazardous waste transporter, provided waste removal and management supports during McCarty Hall remediation. The waste removal, transport, and disposal procedures during remediation is consistent with TSCA and Department of Transportation (DOT) removal and transporting procedures. Regulated wastes generated during the project included PCB contaminated materials and RCRA wastes associated with washing/rinsing fluids.

PCB contaminated materials contained in DOT specification 55-gallon drums and other containers were labeled, assigned PCB tracking numbers, sampled, profiled, and manifested prior to transportation. The wastes were transported by Envirotech, Hazmat Environmental Group and HVTs. They were profiled as decontamination water containing PCBs, PCB transformers, transformer fluid, concrete chunks and

debris, personal protective equipment (PPE), rags, and sawdust contaminated with PCBs. The wastes were transported to Henderson, Kentucky, Kingman, Arizona, Aragonite, Utah, Arlington, Oregon, and Deer Park, Texas. They were disposed at the facilities located in Henderson, Kentucky, Tallmadge, Ohio, Aragonite, Utah, Arlington, Oregon, and Deer Park, Texas.

10.0 CONCLUSIONS

A remedial alternative was conducted to achieve the site-specific cleanup levels. Remedial activities included:

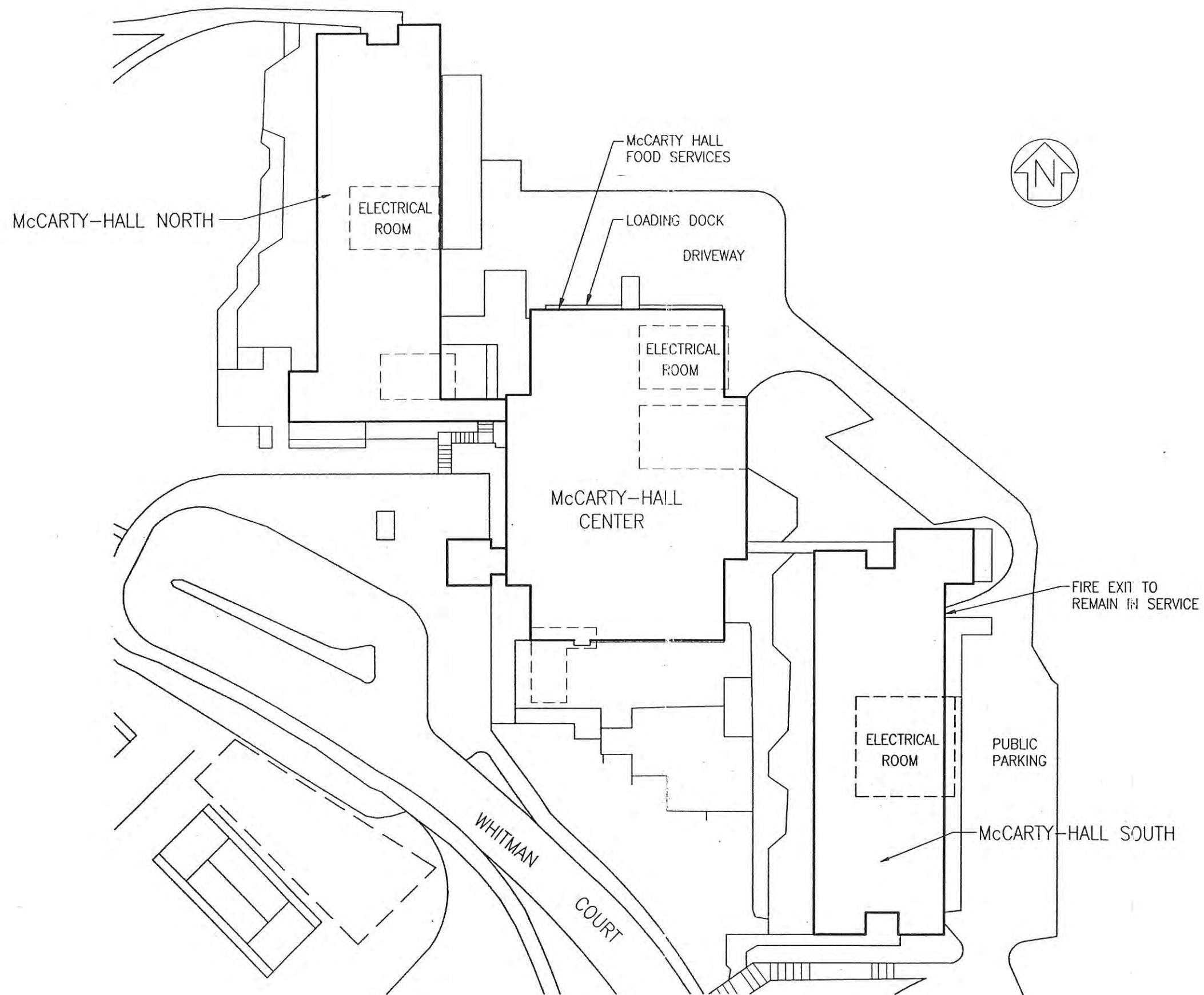
1. removal, disposal, and/or replacement of electrical appurtenances containing PCBs
2. washing and rinsing of concrete surfaces contaminated with PCBs
3. scabbling PCB-contaminated concrete surfaces
4. removal of PCB-contaminated underlying soil up to a depth of 39 inches
5. removal of PCB-contaminated concrete slabs
6. confirmatory wipe sampling and analysis during and following removal or decontamination activities
7. waste disposal

Based on the results of the remedial action, Dames & Moore concludes the following:

- PCB contaminated materials including concrete floors, soils, and other electrical appurtenances have been removed, disposed of, and/or successfully encapsulated.
- Institutional controls are implemented to maintain the integrity of the concrete floor encapsulations and to restrict public access.
- The remedial action is considered to be protective of human health and the environment; therefore, no further action is recommended.

A horizontal scale bar with a black and white alternating pattern. It is labeled '0' at the left end, '500' in the middle, and '1,000' at the right end. Below the bar is the text 'Scale in Feet'.





SITE PLAN - McCARTY HALL

University of Washington
Seattle, Washington
Figure 2

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

Job No. 00681-089-163

APPENDIX A

MCCARTY HALL SOUTH TRANSFORMER VAULT

DATA TABLES AND FIGURES

Table A1: PCB Site Characterization Sampling Results
McCarty Hall, South Transformer Vault
University of Washington

Sample Type	Sample Date	Sample ID	Wipe Sample	
			Results Total PCBs (µg/100 cm ²)	Cleanup Level (µg/100 cm ²)
Wipe	28-Nov-94	MCS-01	0.7 E	10
		MCS-02	1.1	10
		MCS-03	6.7	10
		MCS-04	2.4	10
		MCS-05	580	10
		MCS-06	26	10
		MCS-07	8.8	10
		MCS-08	11	10
	21-Dec-94	MCS-09	1.2 U	10
		MCS-10	0.5 J	10
		MCS-11	0.6 J	10
		MCS-12	0.5 J	10

Notes:

E - Estimated quantity.

U - Undetected at quantitation limit.

J - Estimated value, result was less than detection limit.

Bold - PCB concentrations above the cleanup levels.

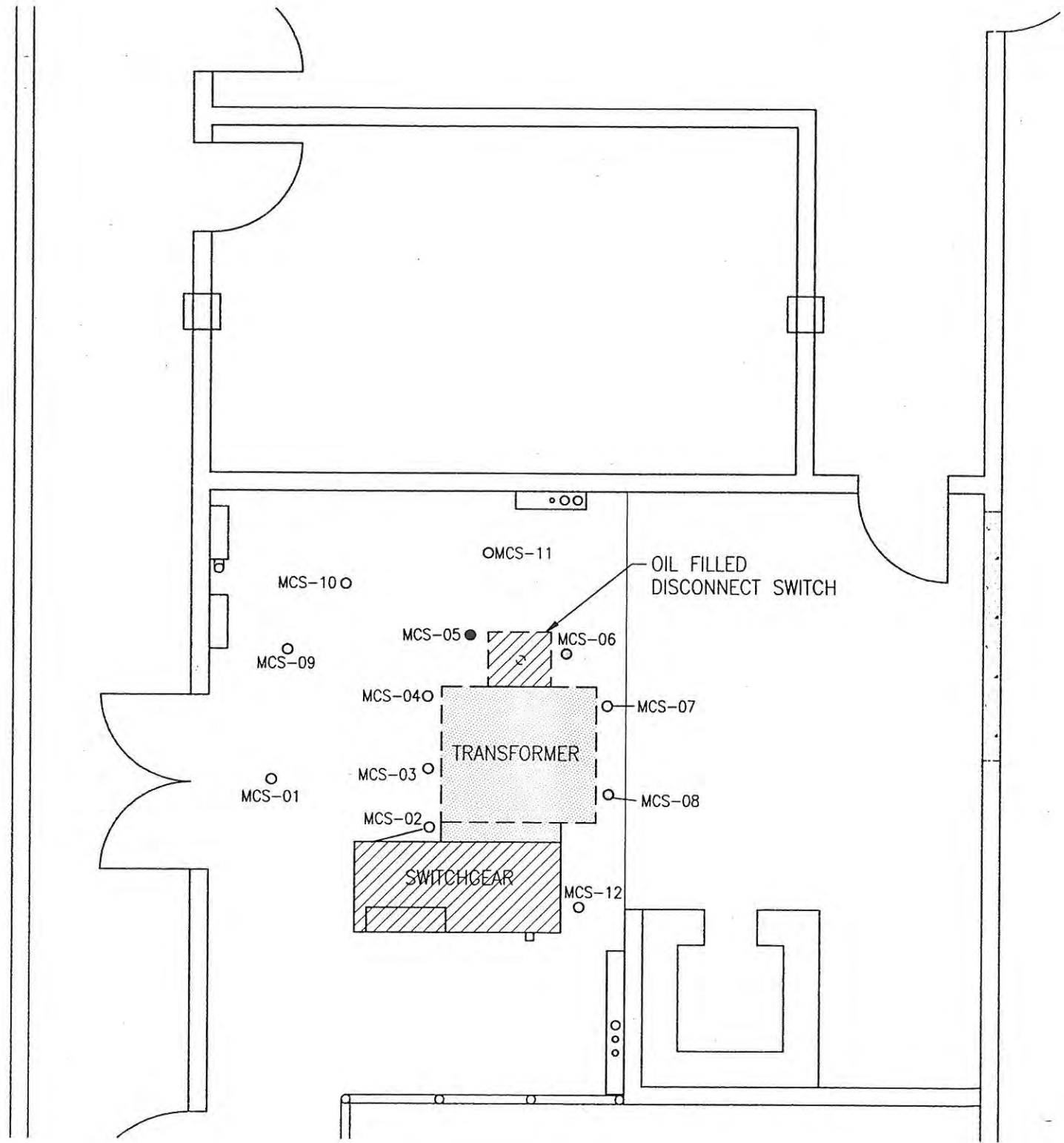
Table A2: PCB Remediation Confirmatory Sampling Results
McCarty Hall, South Transformer Vault
University of Washington

Sample Type	Sample Date	Sample ID	Wipe Sample		
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Further Remedial Actions	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)
Wipe	19-Aug-96	MCSW1	8.9	Encapsulation	100
		MCSW2	23	Encapsulation	100
	28-Aug-96	MCSW3	7	Encapsulation	100
		MCSW4	15	Encapsulation	100
		MCSW5	35	Encapsulation	100
		MCSW6	10	Encapsulation	100
		MCSW7	5.7	Encapsulation	100
		MCSW8	1.0 U	Encapsulation	100
		MCSW9	1.4	Encapsulation	100
		MCSW10	1.6	Encapsulation	100
		MCSW11	1.0 U	Encapsulation	100
		MCSW12	4.8	Encapsulation	100

Notes:

U - Undetected at quantitation limit.

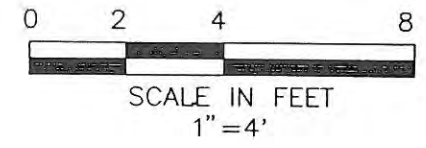
Bold - PCB concentrations above the cleanup levels.



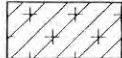
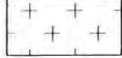

LEGEND

- TRANSFORMER
- SWITCHGEAR OR LOAD BREAK SWITCH
- CONCRETE WIPE SAMPLE LOCATION

 - TOTAL PCB s DETECTED AT GREATER THAN 100µg/100cm²
 - TOTAL PCB s DETECTED BETWEEN 10µg/100cm² AND 100µg/100cm²
 - TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO 10µg/100cm² OR UNDETECTED

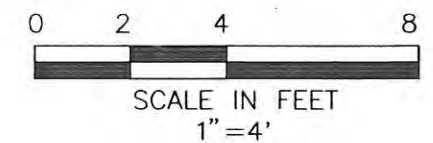
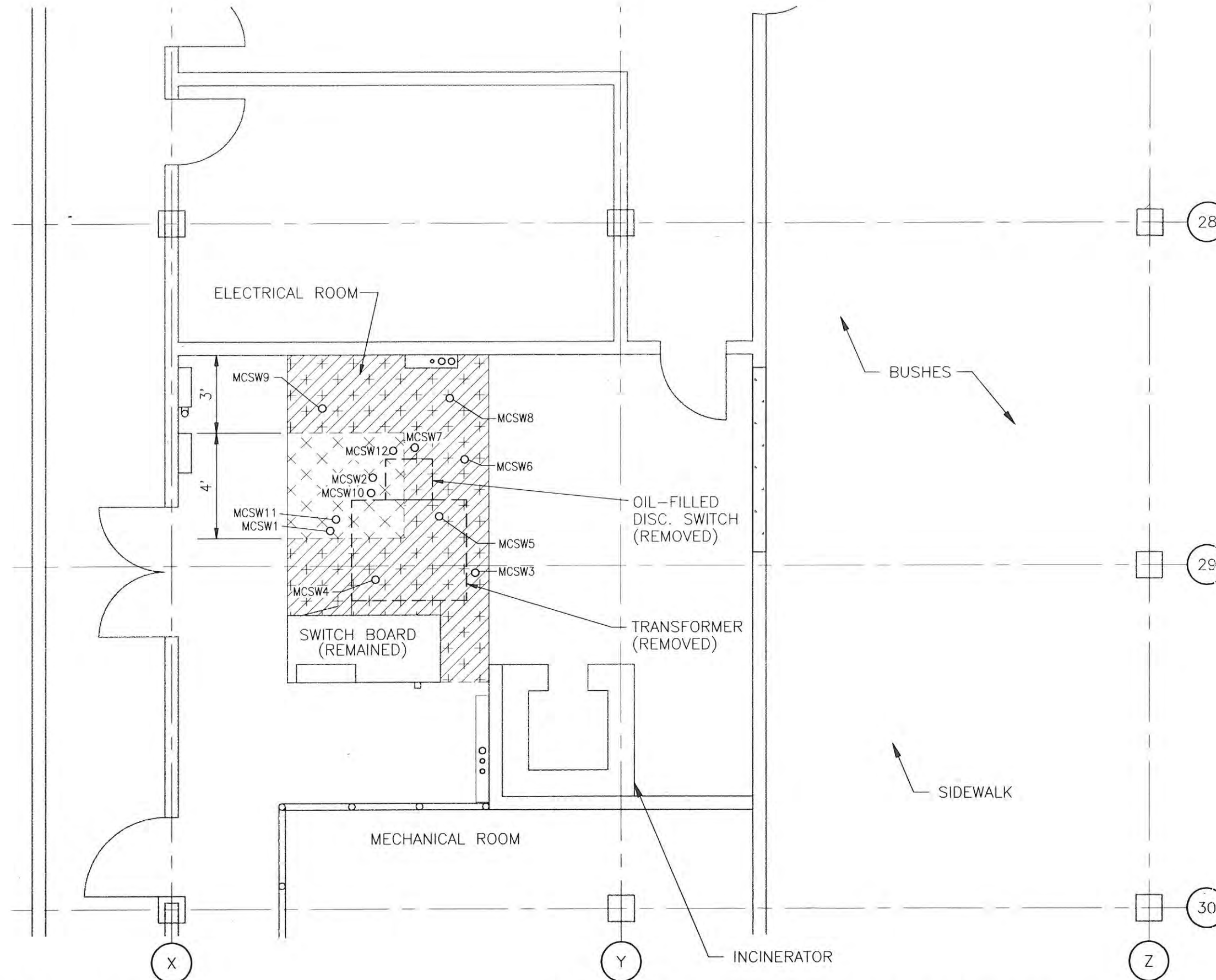


LEGEND

-  WASH/RINSE WITH ENCAPSULATION
-  WASH/RINSE
-  SCABBLING WITH ENCAPSULATION

SURFACE WIPE SAMPLE LOCATION

- TOTAL PCB's DETECTED AT GREATER THAN SITE SPECIFIC CLEANUP LEVEL
- TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO SITE SPECIFIC CLEANUP LEVEL



PCB REMEDIAL ACTIONS AND CONFIRMATORY SAMPLING LOCATIONS - McCARTY HALL, SOUTH ROOM

University of Washington
Seattle, Washington
Figure A2

APPENDIX B

MCCARTY HALL NORTH TRANSFORMER VAULT

DATA TABLES AND FIGURES

**Table B1: PCB Site Characterization Sampling Results
McCarty Hall, North Transformer Vault
University of Washington**

Sample Type	Sample Date	Sample ID	Wipe Sample	
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)
Floor Wipe (vault room)	28-Nov-94	MCN-01	29	10
		MCN-02	240	10
		MCN-03	380	10
		MCN-04	2400	10
		MCN-05	82	10
		MCN-06	200	10
		MCN-07	78	10
		MCN-08	11	10
		MCN-09	10	10
		MCN-10	254	10
		MCN-11	8.3	10
		MCN-12	400	10
		MCN-13	96	10
		MCN-14	26	10
	21-Dec-94	MCN-18	16.1	10
		MCN-19	7.8	10
		MCN-20	15.8	10
		MCN-21	14.6	10
		MCN-22	20.2	10
		MCN-27	11.7	10
		MCN-27-dup	16	10
Floor Wipe (unrestricted Access)	21-Dec-94	MCN-15	1.0 U	10
		MCN-16	1.9 J	10
		MCN-17	1.5	10
Wall Wipe	21-Dec-94	MCN-23	2	10
		MCN-24	0.6 J	10
		MCN-25	3	10
		MCN-26	1	10
Concrete Core	21-Dec-94	MCN-CC-01	390 E	10
		MCN-CC-02	0.84 U	10
		MCN-CC-03	0.86 U	10
		MCN-CC-04	0.83 U	10
		MCN-CC-05	0.81 U	10
Soil	21-Dec-94	MCN-SL-01A-B *	0.81 U	10

Notes:

E - Estimated quantity.

U - Undetected at quantitation limit.

J - Estimated value, result was less than detection limit.

Bold - PCB concentrations above the cleanup level.

* Soil sample was collected at 7" below ground surface.

Table B2: PCB Remediation Confirmatory Sampling Results
McCarty Hall North Transformer Vault
University of Washington

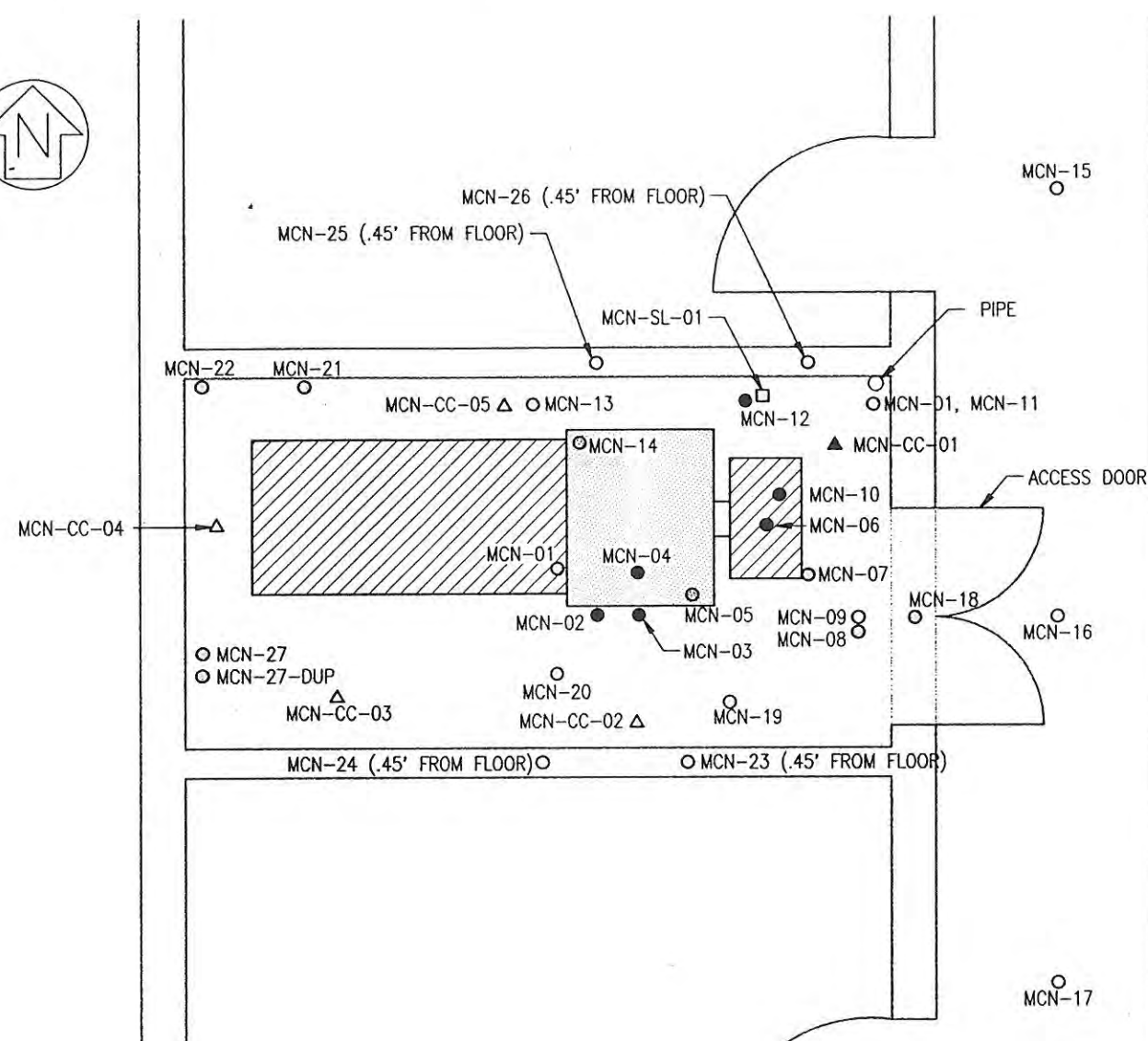
Sample Type	Sample Date	Sample ID	Wipe Sample		Soil Sample		
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Further Remedial Actions	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)
Soil	21-Aug-96	MCN1 *				1.6	10
	21-Aug-96	MCNW1	11	Encapsulation	100		
		MCNW2	160	Concrete Slab Removal	10		
		MCNW3	470	Concrete Slab Removal	10		
		MCNW4	7	Encapsulation	100		
		MCNW4D	11	Encapsulation	100		
	16-Sep-96	MCN101	2.3	No	10		
		MCN102	3.7	No	10		
		MCN102-DUP	4.7	No	10		
		MCN103	1.0 U	No	10		
		MCN104	1.3	No	10		

Notes:



U - Undetected at quantitation limit.

Bold - PCB concentrations above the cleanup levels.

* Soil sample was collected at 7" below ground surface.



LEGEND

-  TRANSFORMER
-  SWITCHGEAR OR LOAD BREAK SWITCH

CONCRETE WIPE SAMPLE LOCATION

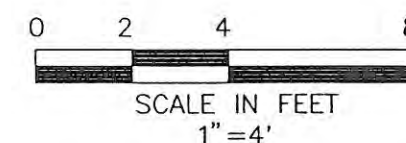
- TOTAL PCB s DETECTED AT GREATER THAN $100\mu\text{g}/\text{cm}^2$
- TOTAL PCB s DETECTED BETWEEN $10\mu\text{g}/100\text{cm}^2$ AND $100\mu\text{g}/100\text{cm}^2$
- TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\mu\text{g}/100\text{cm}^2$ OR UNDETECTED

CONCRETE CORE SAMPLE LOCATION

- ▲ TOTAL PCB s DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$
- △ TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\text{mg}/\text{kg}$ OR UNDETECTED

SOIL SAMPLE LOCATION AT 8" BELOW FLOOR SURFACE

- TOTAL PCB s DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$
- TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\text{mg}/\text{kg}$ OR UNDETECTED



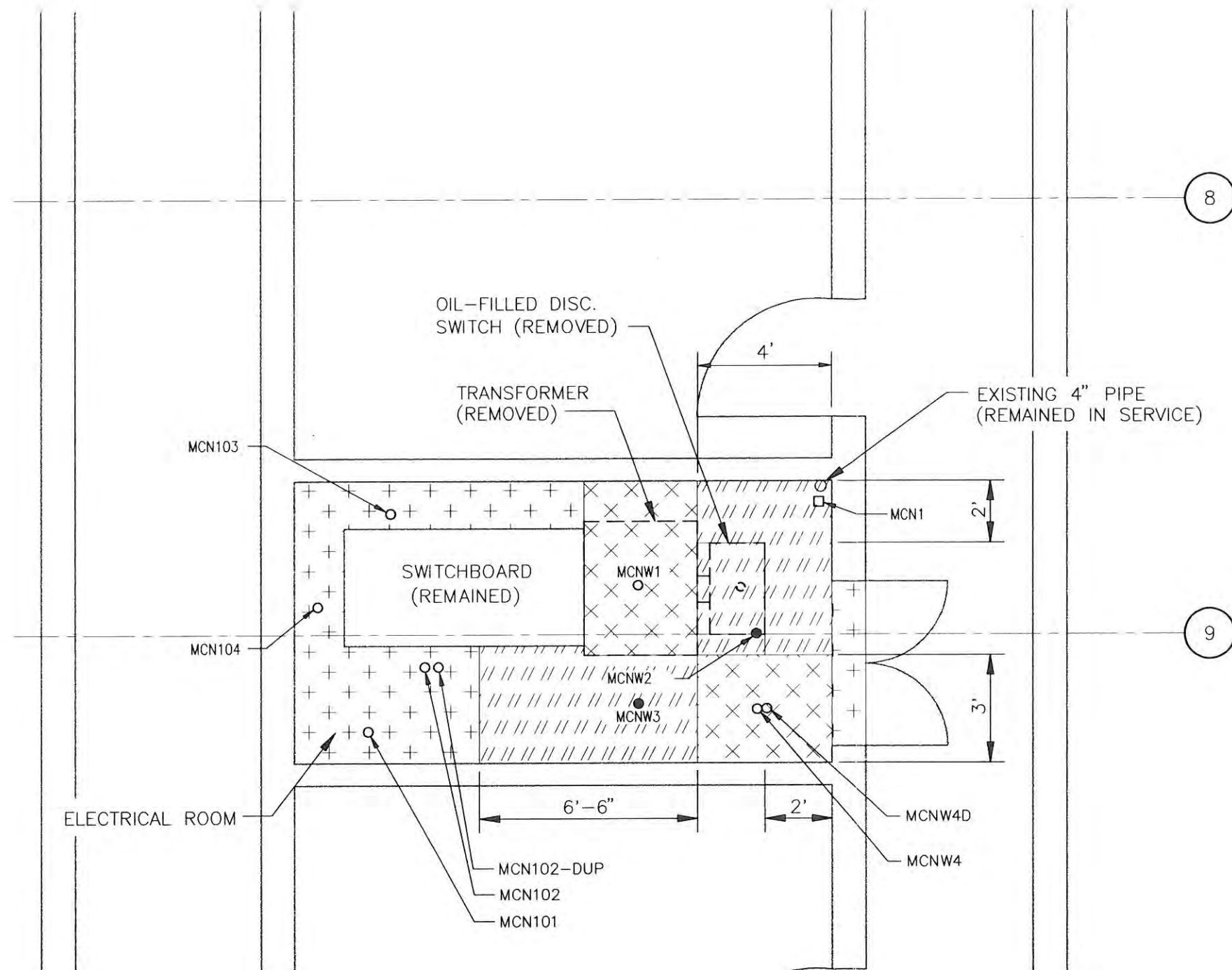
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Job No. 00681-089-163



LEGEND

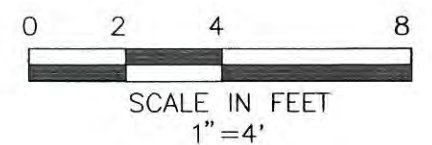
	WASH/RINSE
	SCABBLING WITH ENCAPSULATION
	CONCRETE REMOVAL AND REPLACEMENT

CONCRETE WIPE SAMPLE LOCATION

- TOTAL PCBs DETECTED AT GREATER THAN $100\mu\text{g}/\text{cm}^2$
- TOTAL PCBs DETECTED BETWEEN $10\mu\text{g}/100\text{cm}^2$ AND $100\mu\text{g}/100\text{cm}^2$
- TOTAL PCBs DETECTED AT LESS THAN OR EQUAL TO $10\mu\text{g}/100\text{cm}^2$ OR UNDETECTED

SOIL SAMPLE LOCATION

- TOTAL PCBs DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$
- TOTAL PCBs DETECTED AT LESS THAN OR EQUAL TO $10\text{mg}/\text{kg}$



PCB REMEDIAL ACTIONS AND CONFIRMATORY SAMPLING LOCATIONS - McCARTY HALL, NORTH ROOM

University of Washington
Seattle, Washington
Figure B2

APPENDIX C

MCCARTY HALL CENTRAL TRANSFORMER VAULT

DATA TABLES AND FIGURES

Table C1: PCB Site Characterization Sampling Results
McCarty Hall, Central Transformer Vault
University of Washington

Sampling Date	Sample Type	Sample ID	Wipe Sample		Concrete Core and Soil Sample		
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)
Switchgear Wipe	28-Nov-94	MCC-01	1,210	10			
		MCC-02	87	10			
Floor Wipe (Interior)	28-Nov-94	MCC-03	102	10			
		MCC-04	750	10			
		MCC-05	37	10			
		MCC-06	110	10			
		MCC-07	320	10			
		MCC-08	42	10			
		MCC-09	1,210	10			
		MCC-10	416	10			
		MCC-11	1,620	10			
		MCC-12	5,700	10			
		MCC-13	410	10			
		MCC-14	114	10			
		MCC-15	29,000	10			
		MCC-16	2,200	10			
		MCC-17	420,000	10			
		MCC-18	340,000	10			
		MCC-19	109,000	10			
		MCC-20	3,200	10			
		MCC-21	80,000	10			
	21-Dec-94	MCC-29	6	10			
		MCC-30	17	10			
		MCC-31	12	10			
		MCC-32	10	10			
		MCC-33	21	10			
		MCC-34	41	10			

**Table C1: PCB Site Characterization Sampling Results
McCarty Hall, Central Transformer Vault
University of Washington**

Sampling Date	Sample Type	Sample ID	Wipe Sample		Concrete Core and Soil Sample		
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)
Floor Wipe (Exterior)	21-Dec-94	MCC-23	3	10			
		MCC-24	1.3	10			
		MCC-25	2	10			
		MCC-26	11.1	10			
		MCC-27	3	10			
		MCC-28	1	10			
Wall Wipe	21-Dec-94	MCC-35	14	10			
		MCC-36	2	10			
		MCC-37	1	10			
		MCC-38	1	10			
Concrete Chip	28-Nov-94	CS-MCC-01				30	10
		CS-MCC-02				4,900	10
Concrete Core	21-Dec-94	MCC-CC-01				27	10
		MCC-CC-01-dup				40	10
		MCC-CC-02				2	10
		MCC-CC-03				0	10
		MCC-CC-04				1	10
		MCC-CC-05				9	10
		MCC-CC-06				250	10
		MCC-CC-07				1	10

**Table C1: PCB Site Characterization Sampling Results
McCarty Hall, Central Transformer Vault
University of Washington**

Sampling Date	Sample Type	Sample ID	Wipe Sample		Concrete Core and Soil Sample		
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)
Soil	21-Dec-94	MCC-SL-01A-B			6"	260	10
		MCC-SL-01A-B-dup			6"	73	10
		MCC-SL-01B			20"	650	10
	25-Mar-95	MCC-SL-02A			5"	0.033 U	10
		MCC-SL-02B			29"	0.033 U	10
		MCC-SL-03A			5"	0.027 J	10
		MCC-SL-03B			24"	0.66	10
		MCC-SL-04A			5"	2.8	10
		MCC-SL-04B			9"	0.93	10
		MCC-SL-05A			5"	0.033 U	10
		MCC-SL-05B			29"	0.11	10

Notes:

E - Estimated quantity.

U - Undetected at quantitation limit.

J - Estimated value, result was less than detection limit.

Bold - PCB concentrations above the cleanup levels.

Table C2: VOC Site Characterization Sampling Results
McCarty Hall, Central Transformer Vault
University of Washington

Unit for floor wipe samples: ug/100 cm²

Sampling Type	Sample Date	Sample ID	Chlorobenzene (ug/100 cm ²)	Benzene (ug/100 cm ²)	1,2-Dichlorobenzene (ug/100 cm ²)
Floor Wipe	28-Nov-94	MCC-VOC-01	0.0005	0.0004	0.0016
		MCC-VOC-02	0.0005 U	0.023	0.017 0.0012 U

Unit for concrete chip samples: mg/kg

Sampling Type	Sample Date	Sample ID	MTCA Method B Soil Cleanup Level										
			1,2,4-Trichlorobenzene (mg/kg)	1,2-Dichlorobenzene (mg/kg)	1,2,3-Trichlorobenzene (mg/kg)	1,4-Dichlorobenzene (mg/kg)	1,1,2-Trichlorobenzene (mg/kg)	1,1,1-Trichlorobenzene (mg/kg)	1,1,2,2-Tetrachlorobenzene (mg/kg)	1,1,1,2-Tetrachlorobenzene (mg/kg)	1,1,1,2,2-Pentachlorobenzene (mg/kg)	1,2,3,4-Tetrachlorobenzene (mg/kg)	1,2,3,5-Tetrachlorobenzene (mg/kg)
Concrete Chip	28-Nov-94	CS-MCC-03	800	NA	34.5	72,000	7,200	41.7	NA	NA	90.9	16,000	24,000
		CS-MCC-04	12	3.5	0.005	0.0019	0.012	0.009	0.0023	0.0012	0.001 U	0.001 U	0.002 U
		30 J	11	0.0016	0.001 U	0.12U	0.12U	0.12U	0.002	0.0013	0.0016	0.0022	

Notes:
 NA - Cleanup standard is not available.
Bold - PCB concentrations above the cleanup levels.

Table C3: PCB Remediation Confirmatory Sampling Results
McCarty Hall, Central Vault Room
University of Washington

Sampling Type	Sample Date	Sample ID	Wipe Sample		Concrete Core and Soil Sample			Further Remedial Actions
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)	
Soil (Interior Vault)	7-Aug-96	MCC1			4"	6.6	10	No
		MCC2			8"	18	10	Additional Soil Removal to 20" bgs (MCC-10 & -11)
		MCC3			8"	45	10	Additional Soil Removal to 20" bgs (MCC-10 & -11)
		MCC4			8"	4.1	10	No
		MCC5			8"	1.5	10	No
	14-Aug-96	MCC6			8"	47	10	Additional Soil Removal to 20" bgs (MCC-10 & -11)
		MCC7			24"	13	10	Additional Soil Removal to 26" bgs (MCC-12 & -13)
		MCC8			24"	17	10	Additional Soil Removal to 26" bgs (MCC-12 & -13)
		MCC9			20"	0.95	10	No
		MCC10			20"	0.11	10	No
	15-Aug-96	MCC11			20"	0.097U	10	No
		MCC12			26"	1.2	10	No
		MCC13			26"	48	10	Additional Soil Removal to 34" bgs (MCC-14)
	21-Aug-96	MCC14			34"	190	10	Additional Soil Removal to 39" bgs (MCC-15)
	23-Aug-96	MCC14D			36"	15	10	Additional Soil Removal to 39" bgs (MCC-15)
		MCC14D1			36"	49	10	Additional Soil Removal to 39" bgs (MCC-15)
	29-Aug-96	MCC15			39"	1.7	10	No

Table C3: PCB Remediation Confirmatory Sampling Results
McCarty Hall, Central Vault Room
University of Washington

Sampling Type	Sample Date	Sample ID	Wipe Sample		Concrete Core and Soil Sample			Further Remedial Actions
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (mg/kg)	Cleanup Level (mg/kg)	
Floor Wipe (Interior Vault)	19-Aug-96	MCCW1	0.8	10				No
		MCCW2	1.4	10				No
		MCCW3	2.3	10				No
Wall Wipe (Interior Vault)	28-Aug-96	MCCW4	4	10				No
		MCCW5	5.4	10				No
Switchgear Wipe	7-Sep-96	MCCW101	2.9	10				Additional Wash and Rinse
		MCCW102	12	10				
	25-Sep-96	MCC201	3.3	10				Additional Wash and Rinse
		MCC202	1.5	10				No

Notes:

U - Undetected at quantitation limit.

Bold - PCB concentrations above the cleanup levels.

Table C4: PCB Remediation Confirmatory Sampling Results
McCarty Hall, Central Vault Hallway
University of Washington

Sampling Type	Sample Date	Sample ID	Wipe Sample		Concrete and Soil Sample			Further Remedial Actions
			Results Total PCBs (µg/100 cm ²)	Cleanup Level (µg/100 cm ²)	Depth (inch bgs)	Results Total PCBs (ppm)	Cleanup Level (ppm)	
Floor Wipe	28-Aug-96	MCCW6	10	10				Additional Washing and Rinsing
		MCCW7	32	10				Additional Washing and Rinsing
		MCCW8	14	10				Additional Washing and Rinsing
		MCCW9	3.8	10				Additional Washing and Rinsing
	23-Sep-96	MCC101	15	10				Additional Washing and Rinsing
		MCC102	12	10				Additional Washing and Rinsing
		MCC103	22	10				Additional Washing and Rinsing
		MCC104	26	10				Additional Washing and Rinsing
	26-Sep-96	MCC301	23	100				Encapsulation
		MCC302	9.6	100				Encapsulation
		MCC303	15	100				Encapsulation
		MCC304	43	100				Encapsulation
	8-Oct-96	MCC101A	7.5	100				Encapsulation
		MCC102B	NA	NA				No
		MCC103C	NA	NA				No
		MCC104A	23	100				Encapsulation
		MCC105B	6.9	100				Encapsulation
		MCC106C	NA	NA				No
MCC107B		15	100				Encapsulation	
MCC108C		5.7	100				Encapsulation	
MCC109D		NA	NA				Encapsulation	
MCC109D-DUP		NA	NA				Encapsulation	
MCC-401		430	10				Scabbling of 1 Foot Radius	
MCC-402-A		5.7	100				Encapsulation	

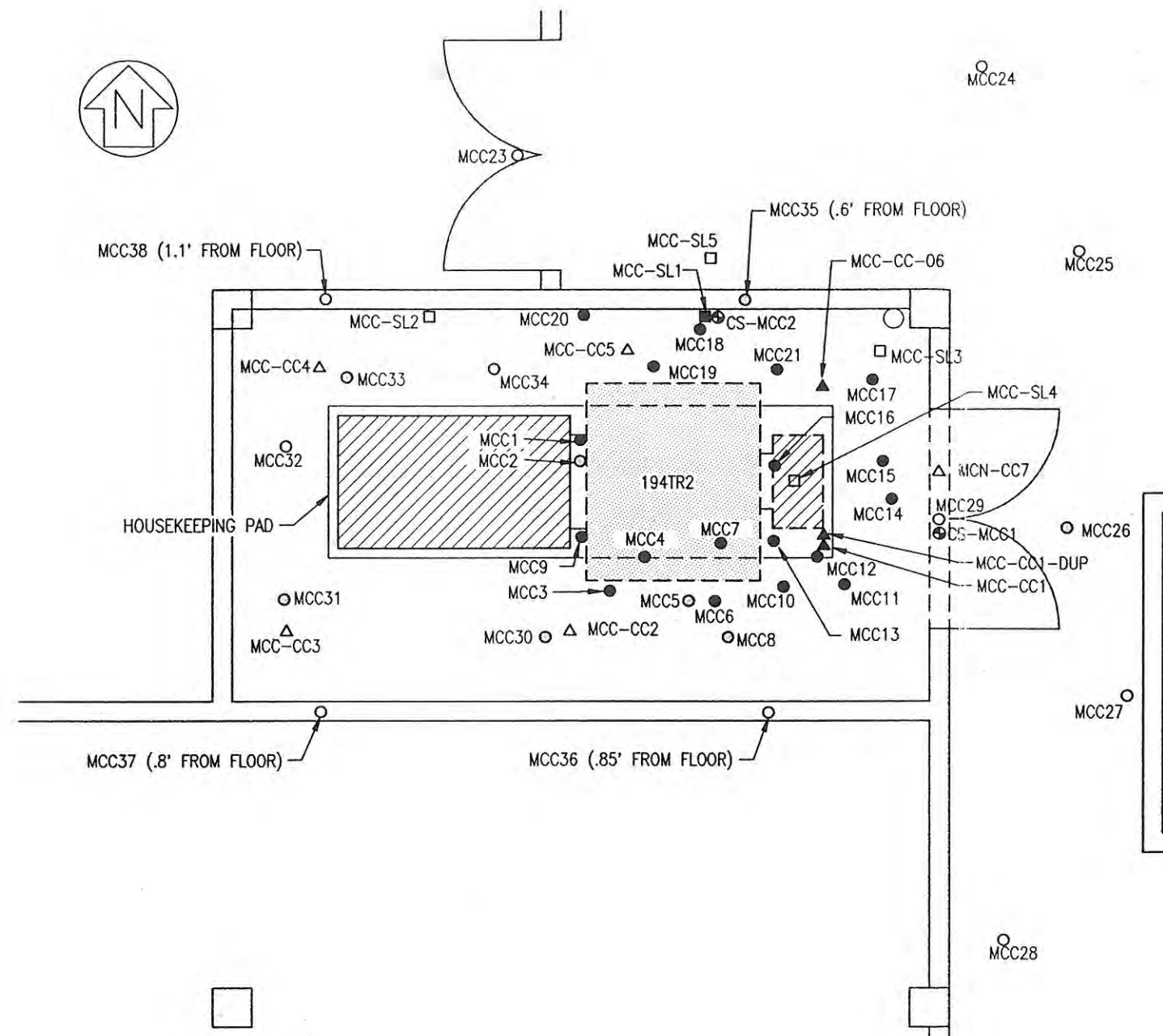
Table C4: PCB Remediation Confirmatory Sampling Results
McCarty Hall, Central Vault Hallway
University of Washington

Sampling Type	Sample Date	Sample ID	Wipe Sample		Concrete and Soil Sample				Further Remedial Actions
			Results Total PCBs ($\mu\text{g}/100\text{ cm}^2$)	Cleanup Level ($\mu\text{g}/100\text{ cm}^2$)	Depth (inch bgs)	Results Total PCBs (ppm)	Cleanup Level (ppm)		
	5-Nov-96	MCC 501	6.5	100				Encapsulation	
		MCC502	1.9	10				No	
		MCC503	11	100				Encapsulation	
		MCC504	4.4	10				No	
	9-Dec-96	MCC-601	990	10				Concrete Slab Removal & Replacement	
	4-Mar-97	MCC-701	2.0U	10				No	
		MCC-702	2.0U	10				No	
Concrete Chip	13-Dec-96	MCCC-01			Surface	7,200	10	Concrete Slab Removal & Replacement	
		MCCC-02			Surface	6.6	10	Concrete Slab Removal & Replacement	
Soil	21-Jan-97	MCCSA1			4"	0.021	10	No	
		MCCSA1			4"	0.34	10	No	


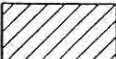
Note:

NA - Sample was not analyzed.

Bold - PCB concentrations above the cleanup levels.



LEGEND

-  TRANSFORMER
-  SWITCHGEAR OR LOAD BREAK SWITCH

CONCRETE WIPE SAMPLE LOCATION

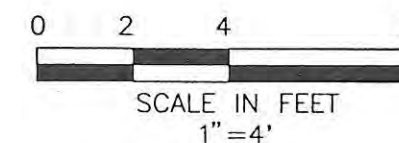
- TOTAL PCB s DETECTED AT GREATER THAN $100\mu\text{g}/\text{cm}^2$
- TOTAL PCB s DETECTED BETWEEN $10\mu\text{g}/100\text{cm}^2$ AND $100\mu\text{g}/100\text{cm}^2$
- TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\mu\text{g}/100\text{cm}^2$ OR UNDETECTED

CONCRETE CHIP AND CORE SAMPLE LOCATION

- ▲ TOTAL PCB s DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$
- △ TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\text{mg}/\text{kg}$ OR UNDETECTED
- ⊕ CONCRETE CHIP SAMPLE OF GROUT (TOTAL PCB s DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$)

SOIL SAMPLE LOCATION

- TOTAL PCB s DETECTED AT GREATER THAN $10\text{mg}/\text{kg}$
- TOTAL PCB s DETECTED AT LESS THAN OR EQUAL TO $10\text{mg}/\text{kg}$ OR UNDETECTED




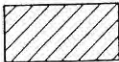


DAMES & MOORE

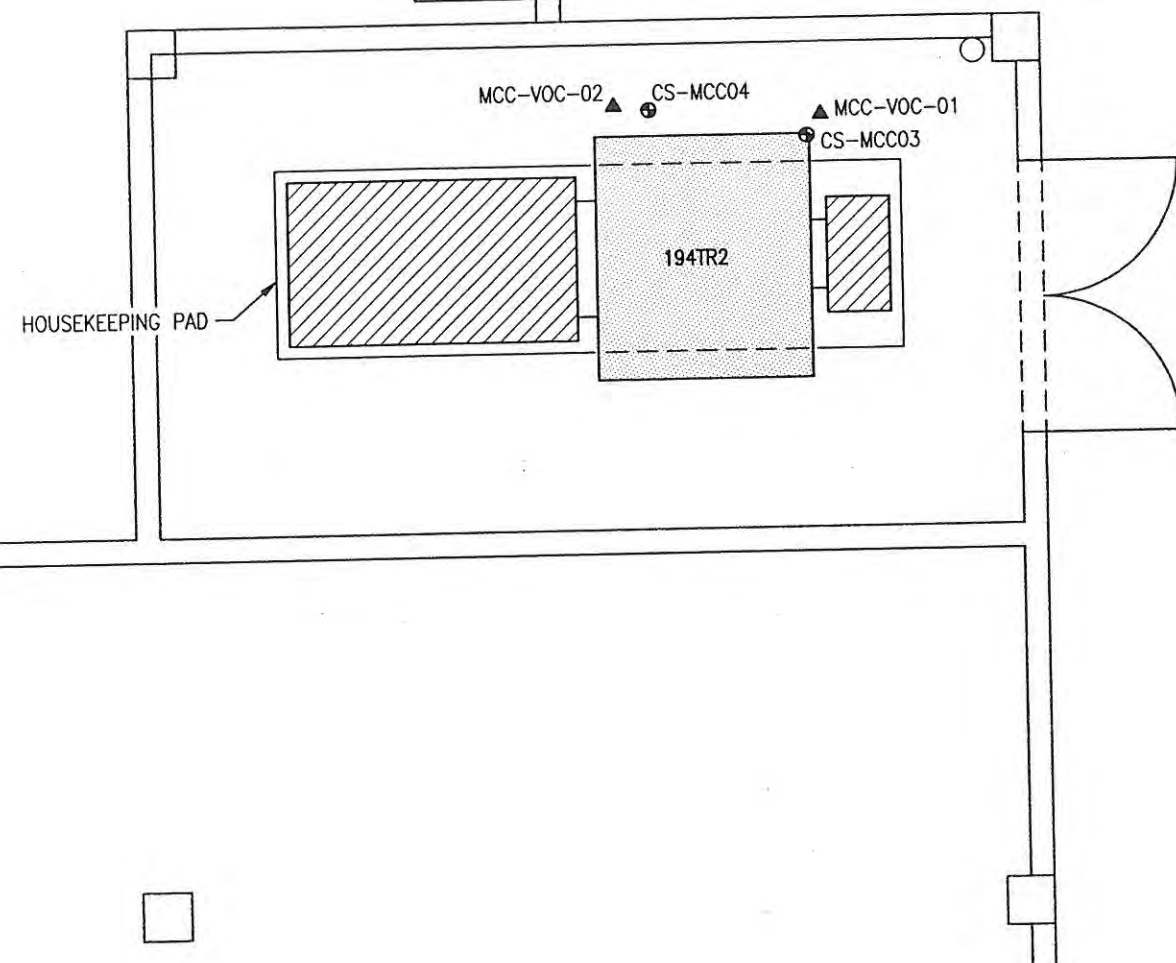
A DAMES & MOORE GROUP COMPANY

PCB SITE CHARACTERIZATION SAMPLE LOCATIONS - McCARTY HALL, CENTRAL ROOM

University of Washington
Seattle, Washington
Figure C1

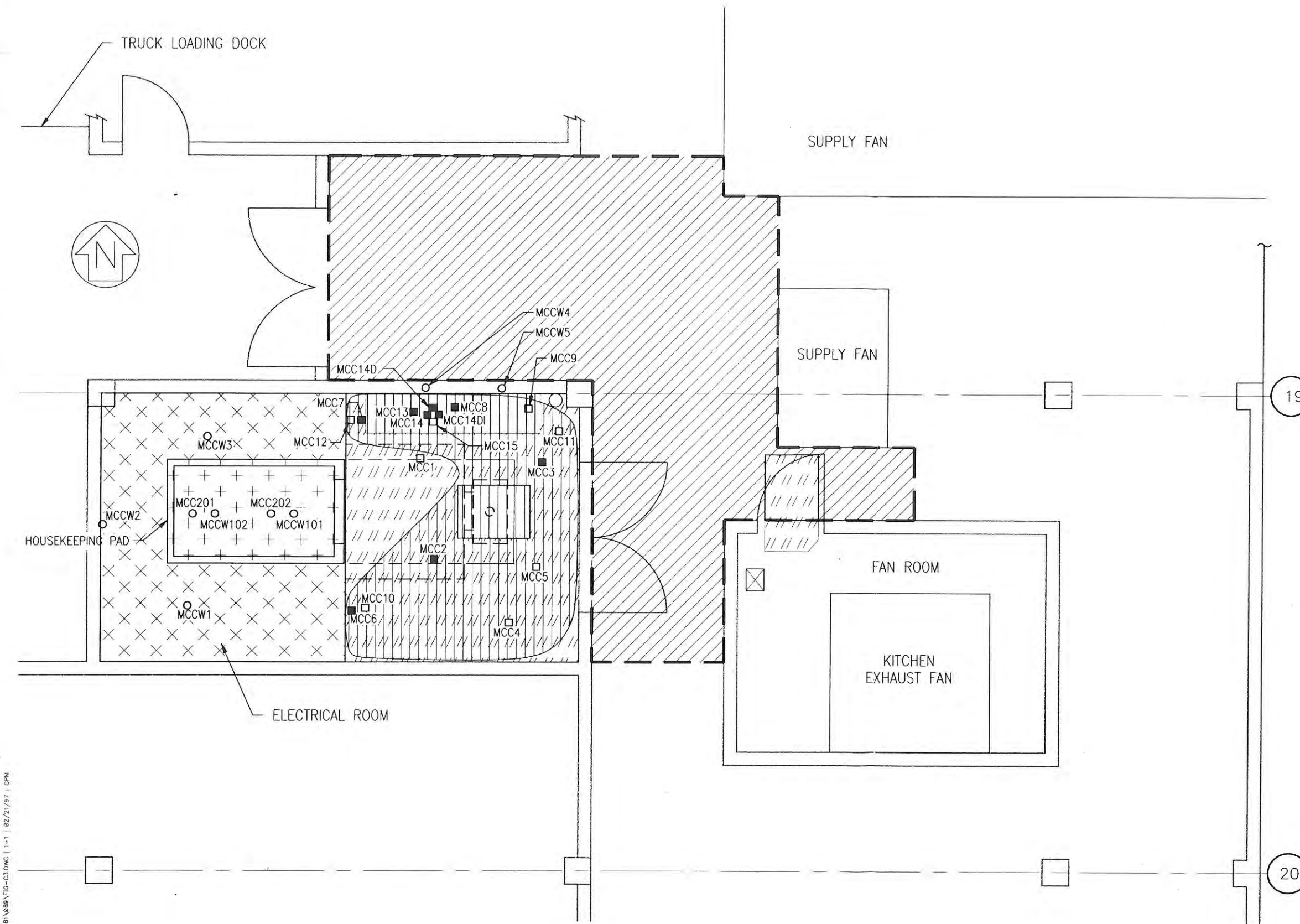
LEGEND

-  TRANSFORMER
-  SWITCHGEAR OR
LOAD BREAK SWITCH
-  VOC WIPE SAMPLE LOCATION
-  VOC CONCRETE CHIP SAMPLE LOCATION



VOC SITE CHARACTERIZATION SAMPLE LOCATIONS - McCARTY HALL, CENTRAL ROOM

University of Washington
Seattle, Washington
Figure C2



LEGEND

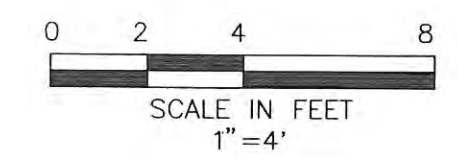
- ENCAPSULATION
- SCABBLING
- WASH/RINSE
- CONCRETE REMOVAL AND REPLACEMENT
- CONCRETE REMOVAL, SOIL/GRAVEL REMOVAL, CONCRETE REPLACEMENT

CONFIRMATORY SOIL SAMPLE LOCATION

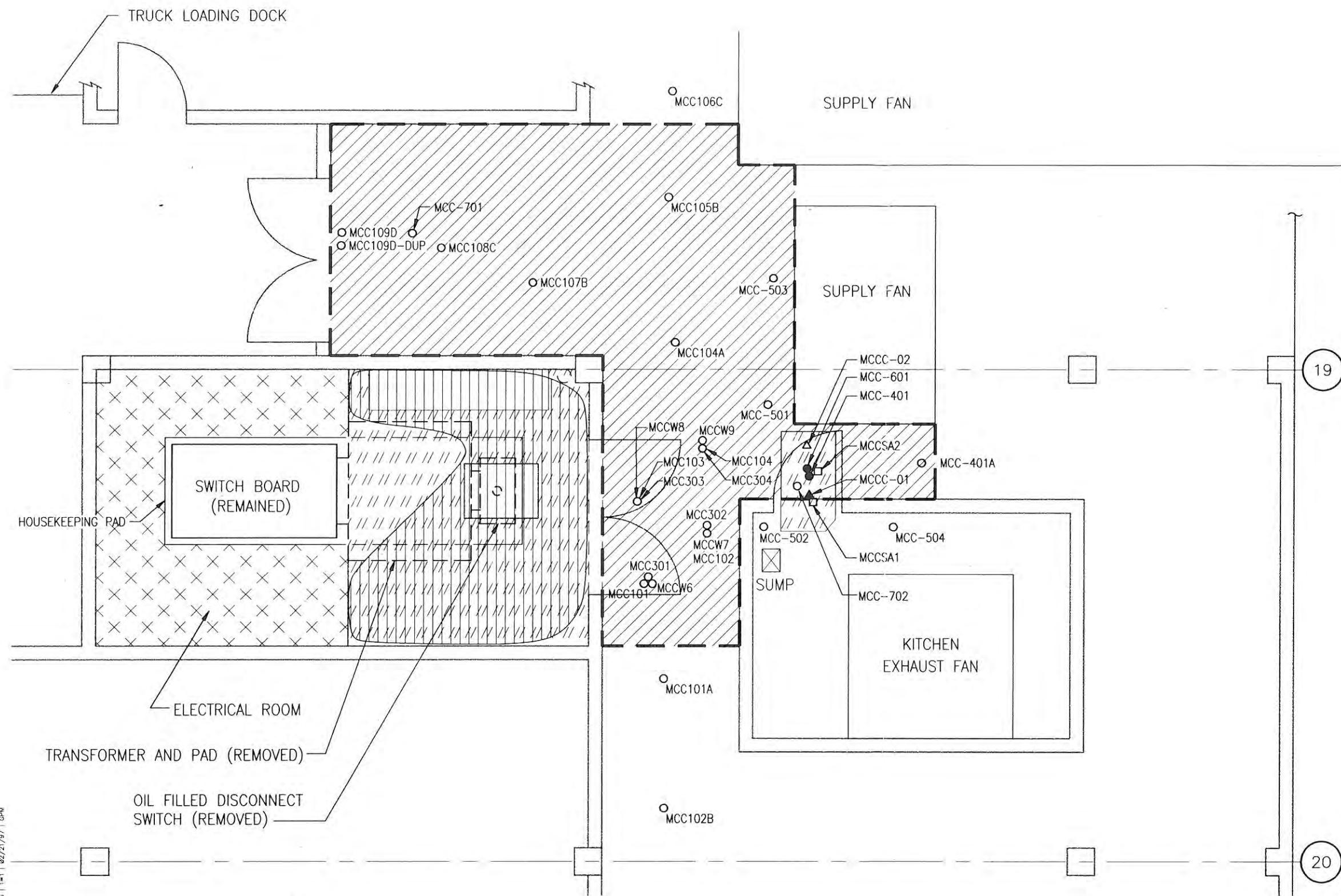
- TOTAL PCB's DETECTED AT GREATER THAN 10mg/kg
- TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO 10mg/kg OR UNDETECTED

CONFIRMATORY WIPE SAMPLE LOCATION



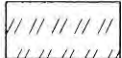

- TOTAL PCB's DETECTED AT GREATER THAN 100µg/cm²
- TOTAL PCB's DETECTED BETWEEN 10µg/100cm² AND 100µg/100cm²
- TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO 10µg/100cm² OR UNDETECTED





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LEGEND

-  ENCAPSULATION
-  SCABBLING
-  CONCRETE REMOVAL AND REPLACEMENT
-  CONCRETE REMOVAL, SOIL/GRAVEL REMOVAL CONCRETE REPLACEMENT



CONFIRMATORY SOIL SAMPLE LOCATION

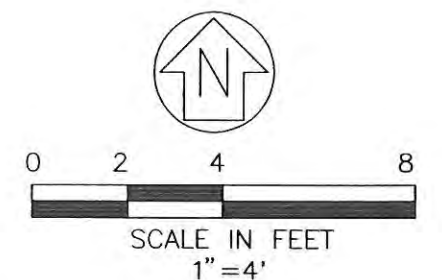
-  TOTAL PCB's DETECTED AT GREATER THAN 10mg/kg
-  TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO 10mg/kg OR UNDETECTED

CONFIRMATORY WIPE SAMPLE LOCATION

-  TOTAL PCB's DETECTED AT GREATER THAN 100µg/cm²
-  TOTAL PCB's DETECTED BETWEEN 10µg/100cm² AND 100µg/100cm²
-  TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO 10µg/100cm² OR UNDETECTED

CONFIRMATORY CONCRETE CHIP/CORE SAMPLE LOCATION

-  TOTAL PCB's DETECTED AT GREATER THAN 10mg/kg
-  TOTAL PCB's DETECTED AT LESS THAN OR EQUAL TO 10mg/kg OR UNDETECTED



APPENDIX D

UNIVERSITY OF WASHINGTON LETTER TO DEPARTMENT OF ECOLOGY (3/23/95)

7

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195-4400

*Environmental Health & Safety
201 Hall Health Center
Box 354400*

March 23, 1995

Department of Ecology
Northwest Regional Office
3190 160th Southeast
Bellevue, Washington 98008

Attention: Mr. Peter Maule
Toxics Cleanup Program

Mr. Norman Peck
Toxics Cleanup Program

Dear Messieurs Maule and Peck:

We appreciate meeting with you on March 14, 1995 to discuss the University of Washington's PCB transformer vault remediation projects conducted to date, and the proposed approach for a future transformer conversion project. This letter summarizes the issues we discussed and represents our understanding of the results of the meeting.

The University is intending to replace three transformers in McCarty Hall at the University of Washington Campus in Seattle, Washington. As part of this process, a focused PCB survey was conducted to assess the potential presence of PCBs. In accordance with WAC 173-340-300, this letter formally notifies Department of Ecology that the University has discovered a limited PCB release to soils (gravels) beneath the central transformer vault concrete floor (room G-046). One pea gravel sample and one field duplicate sample were collected from construction fill material beneath the vault room floor near a groundwire. The PCB concentrations of the gravel samples are 260 mg/kg (MCC-SC-01A-B) and 70 mg/kg (MCC-SC-01A-B Duplicate). The Environmental Protection Agency has also been notified of this contamination. The University intends to further characterize the lateral and vertical extent of PCB-affected gravels beneath the vault floor. The University has retained Dames & Moore for technical and engineering consulting services during the PCB characterization and remediation. We intend to conduct the additional characterization

Telephone: (206) 543-7262

March 23, 1995

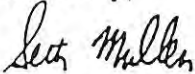
Page 2

within the next 60 days.

At this time, the PCB contaminated soil does not represent a risk to human health and the environment because it is most likely (1) limited to fill materials beneath the vault floor near one groundwire, (2) the groundwire will be sealed to restrict future migration of materials, and (3) the concrete floor will serve to minimize future transport. In addition, the transformer vault is restricted from public access and locked except during maintenance and inspection activities.

Following the soils characterization, the University intends to implement an independent remedial action in accordance with WAC 173-340-510. To avoid the difficulty of dealing with two agencies, the Department of Ecology has agreed to allow the Environmental Protection Agency take the lead role in overseeing the remediation of this site. The cleanup level agreed to by the Environmental Protection Agency for the contaminated soils is 10 parts per million. We will supply you with a closure report when that report is completed.

Sincerely,



Seth Mullen, R.S.

Sanitarian

Environmental Health and Safety



Robin Shoemaker, P.E.

Projects Director for Infrastructure,
Capital Projects

SM/RS/bm

cc: Kimball Jones
Wendy Phippen
Barb McPhee
Don Renbarger

APPENDIX E

UNIVERSITY OF WASHINGTON LETTER TO

ENVIRONMENTAL PROTECTION AGENCY (3/6/95)

42.10.2.2

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195-4400

RECEIVED
MAR 09 1995

DAMES & MOORE
SEATTLE

*Environmental Health & Safety
201 Hall Health Center
Box 354400*

March 6, 1995

Mr. Bill Hedgebeth
Environmental Protection Agency
Region 10
1200 Sixth Avenue, AT-083
Seattle, WA 98101

Re: McCarty Vault Remediation - Project No. 1873
Meeting with University of Washington Representatives
February 16, 1995

Dear Mr. Hedgebeth:

We appreciate meeting with you on February 16, 1995 to discuss the University of Washington's PCB transformer vault remediation projects conducted to date, and the proposed approach for a future transformer conversion project. This letter summarizes the issues we discussed and represents our understanding of the results of the meeting.

The University has begun a program to replace (over the next several years) its current retrofilled transformers with dry-type transformers. As part of the overall program, focused PCB surveys were conducted in targeted transformer vaults to evaluate PCB concentrations resulting from historical (prior to 1987), non-catastrophic leaks, and to determine if remediation is necessary as part of the transformer replacement project. All transformer vaults at the University are restricted from public access and locked except during maintenance and inspection activities. These initial surveys indicate some transformer vaults to be completely free of PCB contamination, while others have been discovered to have varying degrees of contamination. Characterization surveys, which included wipe samples of concrete surfaces, cinder block walls, door curbing surfaces and bulk samples of concrete surfaces, concrete grout, concrete floors, and (in one location) underlying soils (pea gravel), indicated PCBs are present in select vault locations.

The primary focus of our meeting was to present proposed cleanup levels for the transformer vaults based on the cleanup requirements established in 40 CFR, Part 761, Subpart G, and our proposed site-specific remediation alternatives. The University intends to remove material that contains PCBs above the site-specific regulatory levels (established with EPA Region 10). The proposed site-specific cleanup levels and associated rationale for further selection are summarized in Table 1; site-specific

remediation alternatives are provided in Table 2. It is our understanding that EPA Region 10 concurs with the site-specific cleanup levels provided in Table 1 and remediation alternatives provided in Table 2. Based on EPA Region 10's concurrence, the University intends to universally apply these cleanup standards and remediation alternatives for the duration of the transformer conversion project.

Based on previous PCB remediation of transformer vaults, a potential exists for encountering difficulties in meeting cleanup levels for concrete floors and underlying materials. Maintaining building structural integrity may conflict with full pursuit of floor or substrate cleanup levels. If difficulties are encountered during remediation, the University will contact EPA Region 10, provide the technical rationale, and obtain concurrence prior to implementing innovative, remediation alternatives, or variances to the established site-specific cleanup levels (other than those presented in Table 2).

The University proposes to provide EPA Region 10 with closure reports upon completion of PCB remediation of each transformer vault.

We appreciate your support and regulatory guidance towards completing successful PCB remediation projects as a component of our planned transformer replacement program. Please contact us if you have further questions or require clarification.

Sincerely,

Seth Mullen for Kim JONES

Kimball Jones
Environmental Health Officer,
Environmental Health and Safety

Robin Shoemaker

Robin Shoemaker, P.E.
Projects Director for Infrastructure,
Capital Projects

KJ/RS/bm

Attachments: Tables 1 and 2

cc: Don Renbarger, University of Washington
Seth Mullen, University of Washington
Larry Nelson, University of Washington
Melody Allen, Dames & Moore
Julie Harvey, Dames & Moore

TABLE 1
PCB CLEANUP LEVELS

Access	Media	PCB Concentrations	Proposed PCB Cleanup Level	Rationale
Restricted access	Concrete Surfaces	> 100 ug/100 cm ²	100 ug/100 cm ² (with encapsulation)	Selected based on negotiated cleanup levels for Terry Lander Transformer Vault (EPA and the University) 40 CFR 761.125(c)(3)(iii)
	Concrete Surfaces (low contact)	> 10 ug/100 cm ² but < 100 ug/100 cm ²	10 ug/100 cm ² (if cleanup level of 10 ug/100 cm ² cannot be achieved, may encapsulate)	
	Equipment Surfaces	> 10 ug/100 cm ²	10 ug/100 cm ²	
	Soil	> 10 mg/kg	10 mg/kg	
Unrestricted Access	Concrete Surfaces	> 10 ug/100 cm ²	10 ug/100 cm ²	40 CFR 761.125(c)(4)(v) and cleanup levels for soil in unrestricted access areas
				40 CFR 761.125(c)(4)(ii)

TABLE 2
REMEDIAL ALTERNATIVES

Remedial Alternatives	Rationale
PCB Source Removal	Existing oil-filled transformers will be replaced with "dry" transformers; therefore, the PCB source(s) will be removed.
Solvent/Detergent Washing	Proposed where limited surface areas contain PCBs above 10 ug/100 cm ² or localized individual "hot spots" are present above 100 ug/100 cm ² .
Concrete Scabbling	Proposed where surfaces contain PCB concentrations greater than 100 ug/100 cm ² and where concrete chip or core samples contain PCBs > 10 mg/kg.
Encapsulation	Proposed for surfaces where remediation techniques cannot achieve site-specific cleanup levels. Encapsulation will provide a protective coating to eliminate exposure to workers.
Concrete Removal	Proposed where PCBs are present in expansion joints and associated transformer pad. This technique may be more cost effective than other techniques where structurally feasible.
Soil Removal	Proposed where limited volumes of contaminated material are present and structural integrity is not a concern.
Soil fixation and removal of transport mechanism	Proposed where underlying soils cannot be removed due to structural concerns. Institutional controls will be implemented.
Institutional Controls	Proposed where cleanup levels cannot be achieved. Institutional controls would include: Continued restricted access; Inspection, operation, and maintenance procedures for encapsulated areas; Notations on building specifications; and Deed Restrictions.

APPENDIX F

**CHAIN OF CUSTODIES, LETTERS OF QUALITY CONTROL AND ASSURANCE, AND
LABORATORY RESULTS**

Memo



DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
206 728 0744 Telephone
206 727 3364 Fax

To: Steve Hitch, Project Manager

Info:

From: Brian Custer, Staff Chemist *B. C.*

Date: June 18, 1997

RE: **McCarty Hall Surface Wipe, Soil and Concrete PCB Data**

Twenty-four (24) analytical reports from Sound Analytical Services, Inc.(SAS) and Analytical Resources, Inc. (ARI) have been reviewed in accordance with Dames & Moore's Quality Assurance Program. The reports include surface, soil and concrete polychlorinated biphenyl (PCB) analytical results and associated quality control. The quality control results were compared to the laboratory-established statistical control limits which were applicable during the time which the analyses were conducted. In addition to laboratory quality control, two duplicate sample pairs and three field blanks were collected and analyzed by the laboratories as project samples. The relative percent difference between duplicate pairs was calculated and is reported below. Analytical results for field blanks and method blanks were reviewed to ensure that target analytes had not been detected. Sample handling and storage time before extraction were also reviewed using information from chain-of-custodies and the analytical reports. The following specific reports were reviewed:

<u>Report Date</u>	<u>Laboratory</u>	<u>Report Number</u>	<u>Review Status</u>
August 9, 1996	SAS	58582	Acceptable
August 16, 1996	SAS	58734	Acceptable
August 19, 1996	SAS	58791	Acceptable
August 20, 1996	SAS	58828	Acceptable
August 21, 1996	SAS	58840	Acceptable
August 22, 1996	SAS	58881	Acceptable
August 23, 1996	SAS	58894	Acceptable
August 26, 1996	SAS	58962	Acceptable
August 29, 1996	SAS	59074	Acceptable
September 3, 1996	ARI	P957	Acceptable
September 13, 1996	ARI	Q054	Acceptable
September 24, 1996	ARI	Q151	Acceptable
September 25, 1996	SAS	59684	Acceptable
September 26, 1996	SAS	59762	Acceptable
September 30, 1996	SAS	59790	Acceptable
October 15, 1996	ARI	Q408, parts I-III	Acceptable
October 29, 1996	ARI	Q617	Acceptable
October 31, 1996	ARI	Q617II	Acceptable
November 8, 1996	ARI	Q699	Acceptable

<u>Report Date</u>	<u>Laboratory</u>	<u>Report Number</u>	<u>Review Status</u>
December 11, 1996	ARI	R021	Acceptable
December 17 and 18, 1996	ARI	R118 Parts I and II	Acceptable
January 23, 1997	ARI	R447	Acceptable
March 11, 1997	ARI	R821	Acceptable

Conclusions

Quality control (QC) reported by both laboratories included surrogate spike recovery (method required), method blank analysis and blank spike or laboratory control sample analysis. SAS also reported blank spike duplicate analyses and RPD while ARI did not. SAS also reported analysis results of MS/MSD samples and used project soil samples for these analyses. Neither laboratory reported MS/MSD analyses of wipe samples. A complete assessment of analytical precision of the ARI data reviewed was not possible since duplicate blank spikes were not analyzed nor were other data such as sample replicate analysis or instrument calibration presented by this laboratory. The relative analytical bias of sample results was evaluated based on the results of BS/BSD analyses, the limited MS/MSD analytical results presented by SAS, surrogate recovery (which was not possible for diluted samples reported by SAS and several diluted sample results reported by ARI).

In most cases surrogate recovery reported by both laboratories was within both laboratories' statistical control limits except for samples in which the surrogates were reported to have been diluted out as discussed previously. SAS did not include the original un-diluted sample results in their reports and instead reported only the diluted sample results that were within the instrument's range. ARI, on the other hand, reported all sample results including re-analysis of diluted samples which allowed evaluation of surrogate recovery in the un-diluted sample. Target analytes were not reported in method blanks analyzed with samples included in any of the SAS or ARI reports reviewed. Based on the information presented, laboratory QC for estimating analytical bias presented by both laboratories was within statistical control established by both laboratories. Project sample results reported by both laboratories were therefore not qualified based on the QC reviewed.

Analytical precision was evaluated from results of BS/BSD RPDs (SAS Data only) and the RPDs reported for the two MS/MSD analyses of soil and surface wipes (presented by SAS only). Other information such as calibration data, historical MS/MSD analyses, or replicate analyses were not requested by Dames & Moore and hence, not reviewed during this assessment. The evaluation of SAS QC data indicates that the control limit established by the laboratory for BS/BSD RPDs was not exceeded. The RPD control limit for the soil MS/MSD analysis was exceeded which indicates that the analysis of this sample was not in control. Due to the limited MS/MSD data presented, a determination that the lab could not precisely determine the amount of PCB target analytes in the project soil matrix could not be made. The soil project data reported by SAS were therefore not qualified. Sufficient QC information was not provided by ARI to confidently assess analytical precision of project data presented in their reports.

Quality control samples collected by Dames & Moore during sample collection activities and analyzed by both labs included several field surface wipe blanks, consisting of un-used wipes in hexane and enclosed in the same type of sample container as project samples, and two pairs of sample duplicates, one pair of which was collected from soil and one pair collected from surfaces with wipes. Due to the lack of sufficient

numbers of sample duplicate pairs from each matrix sampled during the project, an estimate of the standard deviation for each duplicate pair using common estimating formulas was not calculated and consequently, calculation of confidence intervals for project data specific to each matrix (e.g. soil, surface dust, concrete) was also not possible. The calculated RPD for the soil sample duplicate pair was 38% and for the wipe sample duplicate pair the calculated RPD was 1.2%. Control limits for RPDs of these types of duplicates were not provided by project plans or a QAPP and therefore are presented for informational purposes only. Target analytes were not reported in any of the surface wipe blanks analyzed by the laboratories. Due to the limited field QC information available, a complete assessment of the precision of project data could not be made. Project sample data were not qualified based on these results.

The reported storage time prior to extraction of all samples and matrices represented did not exceed holding time limits recommended by the USEPA.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 9, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-089-163 U W McCarty

REPORT NUMBER: 58582

Enclosed are the test results for four sample received at Sound Analytical Services on August 8, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager

DJP:tm

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC1
Lab ID:	58582-01
Date Received:	8/8/96
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
% Solids	97.75

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	101		50	150
Decachlorobiphenyl	133		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	6.6	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC2
Lab ID:	58582-02
Date Received:	8/8/96
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
% Solids	97.13

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	108		50	150
Decachlorobiphenyl	117		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.98	
Aroclor 1221	ND	0.98	
Aroclor 1232	ND	0.98	
Aroclor 1242	ND	0.98	
Aroclor 1248	ND	0.98	
Aroclor 1254	ND	0.98	
Aroclor 1260	18	0.98	
Aroclor 1262	ND	0.98	
Aroclor 1268	ND	0.98	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC3
Lab ID:	58582-03
Date Received:	8/8/96
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
% Solids	99.11

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	4.7	
Aroclor 1221	ND	4.7	
Aroclor 1232	ND	4.7	
Aroclor 1242	ND	4.7	
Aroclor 1248	ND	4.7	
Aroclor 1254	ND	4.7	
Aroclor 1260	45	4.7	
Aroclor 1262	ND	4.7	
Aroclor 1268	ND	4.7	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC4
Lab ID:	58582-04
Date Received:	8/8/96
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
% Solids	97.76

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	94		50	150
Decachlorobiphenyl	109		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.097	
Aroclor 1221	ND	0.097	
Aroclor 1232	ND	0.097	
Aroclor 1242	ND	0.097	
Aroclor 1248	ND	0.097	
Aroclor 1254	ND	0.097	
Aroclor 1260	4.1	0.097	
Aroclor 1262	ND	0.097	
Aroclor 1268	ND	0.097	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB694
Date Received:	-
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	103		50	150
Decachlorobiphenyl	112		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.099	
Aroclor 1221	ND	0.099	
Aroclor 1232	ND	0.099	
Aroclor 1242	ND	0.099	
Aroclor 1248	ND	0.099	
Aroclor 1254	ND	0.099	
Aroclor 1260	ND	0.099	
Aroclor 1262	ND	0.099	
Aroclor 1268	ND	0.099	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PCB694
Date Prepared:	8/8/96
Date Analyzed:	8/8/96
QC Batch ID:	PCB694

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.995	0.975	98	0.93	99	1	

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED
AUG 20 1996

~~THE~~ DAMES & MOORE
SEATTLE

DATE: August 16, 1996

TO: Lee Hatcher
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 58734

Enclosed are the test results for five samples received at Sound Analytical Services on August 14, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla Powell
Project Manager

DJP:tm



DAMES & MOORE

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 8/14/96 Page 1 of 1

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC5
Lab ID:	58734-01
Date Received:	8/14/96
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	98.8

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	106		50	150
Decachlorobiphenyl	102		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.1	
Aroclor 1221	ND	0.1	
Aroclor 1232	ND	0.1	
Aroclor 1242	ND	0.1	
Aroclor 1248	ND	0.1	
Aroclor 1254	ND	0.1	
Aroclor 1260	1.5	0.1	
Aroclor 1262	ND	0.1	
Aroclor 1268	ND	0.1	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC6
Lab ID:	58734-02
Date Received:	8/14/96
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	95.28

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	2	
Aroclor 1221	ND	2	
Aroclor 1232	ND	2	
Aroclor 1242	ND	2	
Aroclor 1248	ND	2	
Aroclor 1254	ND	2	
Aroclor 1260	47	2	
Aroclor 1262	ND	2	
Aroclor 1268	ND	2	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC7
Lab ID:	58734-03
Date Received:	8/14/96
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	99.07

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.99	
Aroclor 1221	ND	0.99	
Aroclor 1232	ND	0.99	
Aroclor 1242	ND	0.99	
Aroclor 1248	ND	0.99	
Aroclor 1254	ND	0.99	
Aroclor 1260	13	0.99	
Aroclor 1262	ND	0.99	
Aroclor 1268	ND	0.99	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC8
Lab ID:	58734-04
Date Received:	8/14/96
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	99.46

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.97	
Aroclor 1221	ND	0.97	
Aroclor 1232	ND	0.97	
Aroclor 1242	ND	0.97	
Aroclor 1248	ND	0.97	
Aroclor 1254	ND	0.97	
Aroclor 1260	17	0.97	
Aroclor 1262	ND	0.97	
Aroclor 1268	ND	0.97	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC9
Lab ID:	58734-05
Date Received:	8/14/96
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	99.38

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	111		50	150
Decachlorobiphenyl	106		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.095	
Aroclor 1221	ND	0.095	
Aroclor 1232	ND	0.095	
Aroclor 1242	ND	0.095	
Aroclor 1248	ND	0.095	
Aroclor 1254	ND	0.095	
Aroclor 1260	0.95	0.095	
Aroclor 1262	ND	0.095	
Aroclor 1268	ND	0.095	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB704
Date Received:	-
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	104		50	150
Decachlorobiphenyl	101		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.092	
Aroclor 1221	ND	0.092	
Aroclor 1232	ND	0.092	
Aroclor 1242	ND	0.092	
Aroclor 1248	ND	0.092	
Aroclor 1254	ND	0.092	
Aroclor 1260	ND	0.092	
Aroclor 1262	ND	0.092	
Aroclor 1268	ND	0.092	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB704
Date Prepared: 8/15/96
Date Analyzed: 8/15/96
QC Batch ID: PCB704

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.934	1.02	109	1.08	110	0.91	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	MCC5
Lab ID:	58734-01
Date Prepared:	8/15/96
Date Analyzed:	8/15/96
QC Batch ID:	PCB704

PCBs by USEPA Method 8080

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1260	1.5	0.964	2.36	93.4	2.39	94.5	1.2	

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 19, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 58791

Enclosed are the test results for two samples received at Sound Analytical Services on August 16, 1996.

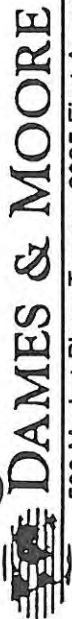
The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla Powell
Project Manager

DP:tm



Date ___/___/___ Page ___ of ___

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC10
Lab ID:	58791-01
Date Received:	8/16/96
Date Prepared:	8/16/96
Date Analyzed:	8/16/96
% Solids	94.52

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	131		50	150
Decachlorobiphenyl	112		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.1	
Aroclor 1221	ND	0.1	
Aroclor 1232	ND	0.1	
Aroclor 1242	ND	0.1	
Aroclor 1248	ND	0.1	
Aroclor 1254	ND	0.1	
Aroclor 1260	0.11	0.1	
Aroclor 1262	ND	0.1	
Aroclor 1268	ND	0.1	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC11
Lab ID:	58791-02
Date Received:	8/16/96
Date Prepared:	8/16/96
Date Analyzed:	8/16/96
% Solids	99.22

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	140		50	150
Decachlorobiphenyl	119		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.097	
Aroclor 1221	ND	0.097	
Aroclor 1232	ND	0.097	
Aroclor 1242	ND	0.097	
Aroclor 1248	ND	0.097	
Aroclor 1254	ND	0.097	
Aroclor 1260	ND	0.097	
Aroclor 1262	ND	0.097	
Aroclor 1268	ND	0.097	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB707
Date Received:	-
Date Prepared:	8/16/96
Date Analyzed:	8/16/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	135		50	150
Decachlorobiphenyl	117		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.093	
Aroclor 1221	ND	0.093	
Aroclor 1232	ND	0.093	
Aroclor 1242	ND	0.093	
Aroclor 1248	ND	0.093	
Aroclor 1254	ND	0.093	
Aroclor 1260	ND	0.093	
Aroclor 1262	ND	0.093	
Aroclor 1268	ND	0.093	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PCB707
Date Prepared:	8/16/96
Date Analyzed:	8/16/96
QC Batch ID:	PCB707

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.947	1.04	110	1.05	109	0.91	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID: MCC10
Lab ID: 58791-01
Date Prepared: 8/16/96
Date Analyzed: 8/16/96
QC Batch ID: PCB707

PCBs by USEPA Method 8080

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1260	0.11	0.993	1.16	106	1.18	107	0.94	

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 20, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: McCarty

REPORT NUMBER: 58828

Enclosed are the test results for five samples received at Sound Analytical Services on August 19, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager

DJP:tm

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC12
Lab ID:	58828-01
Date Received:	8/19/96
Date Prepared:	8/19/96
Date Analyzed:	8/19/96
% Solids	99.33

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	100		50	150
Decachlorobiphenyl	82		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.1	
Aroclor 1221	ND	0.1	
Aroclor 1232	ND	0.1	
Aroclor 1242	ND	0.1	
Aroclor 1248	ND	0.1	
Aroclor 1254	ND	0.1	
Aroclor 1260	1.2	0.1	
Aroclor 1262	ND	0.1	
Aroclor 1268	ND	0.1	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC13
Lab ID:	58828-02
Date Received:	8/19/96
Date Prepared:	8/19/96
Date Analyzed:	8/20/96
% Solids	99.44

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	4.6	
Aroclor 1221	ND	4.6	
Aroclor 1232	ND	4.6	
Aroclor 1242	ND	4.6	
Aroclor 1248	ND	4.6	
Aroclor 1254	ND	4.6	
Aroclor 1260	48	4.6	
Aroclor 1262	ND	4.6	
Aroclor 1268	ND	4.6	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCCW1
Lab ID:	58828-03
Date Received:	8/19/96
Date Prepared:	8/19/96
Date Analyzed:	8/19/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	114		50	150
Decachlorobiphenyl	103		50	150

Analyte	Result		PQL	Flags
	(ug/100 cm ²)			
Aroclor 1016	ND		0.5	
Aroclor 1221	ND		0.5	
Aroclor 1232	ND		0.5	
Aroclor 1242	ND		0.5	
Aroclor 1248	ND		0.5	
Aroclor 1254	ND		0.5	
Aroclor 1260		0.8	0.5	
Aroclor 1262	ND		0.5	
Aroclor 1268	ND		0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCCW2
Lab ID:	58828-04
Date Received:	8/19/96
Date Prepared:	8/19/96
Date Analyzed:	8/19/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	115		50	150
Decachlorobiphenyl	109		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	1.4	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCCW3
Lab ID:	58828-05
Date Received:	8/19/96
Date Prepared:	8/19/96
Date Analyzed:	8/19/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	116		50	150
Decachlorobiphenyl	97		50	150

Analyte	Result (ug/100 cm ²)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	2.3	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:
Date Received:
Date Prepared:
Date Analyzed:
% Solids

Method Blank - PCB708

8/19/96

8/19/96

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	102		50	150
Decachlorobiphenyl	100		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB709
Date Received:	-
Date Prepared:	8/19/96
Date Analyzed:	8/19/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	101		50	150
Decachlorobiphenyl	95		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.095	
Aroclor 1221	ND	0.095	
Aroclor 1232	ND	0.095	
Aroclor 1242	ND	0.095	
Aroclor 1248	ND	0.095	
Aroclor 1254	ND	0.095	
Aroclor 1260	ND	0.095	
Aroclor 1262	ND	0.095	
Aroclor 1268	ND	0.095	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB708
Date Prepared: 8/19/96
Date Analyzed: 8/19/96
QC Batch ID: PCB708

PCBs by USEPA Method 8080

Compound Name	Blank Result (ug/100 cm ²)	Spike Amount (ug/100 cm ²)	BS Result (ug/100 cm ²)	BS % Rec.	BSD Result (ug/100 cm ²)	BSD % Rec.	RPD
Aroclor 1260	0	5	5.4	108	5.5	110	1.8

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB709
Date Prepared: 8/19/96
Date Analyzed: 8/19/96
QC Batch ID: PCB709

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.926	0.917	99	0.928	101	2	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID: MCC12
Lab ID: 58828-01
Date Prepared: 8/19/96
Date Analyzed: 8/19/96
QC Batch ID: PCB709

PCBs by USEPA Method 8080

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1260	1.2	0.93	2.51	140	2.42	122	14	

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 21, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 58840

Enclosed are the test results for two samples received at Sound Analytical Services on August 19, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,



Darla Powell
Project Manager

DP:tm



Chain of Custody

Date 8/19/96 Page 1 of 1[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCSW1
Lab ID:	58840-01
Date Received:	8/19/96
Date Prepared:	8/20/96
Date Analyzed:	8/20/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	108		50	150
Decachlorobiphenyl	113		50	150

Analyte	Result		PQL	Flags
	(ug/100 cm ²)			
Aroclor 1016	ND		0.5	
Aroclor 1221	ND		0.5	
Aroclor 1232	ND		0.5	
Aroclor 1242	ND		0.5	
Aroclor 1248	ND		0.5	
Aroclor 1254	ND		0.5	
Aroclor 1260		8.9	0.5	
Aroclor 1262	ND		0.5	
Aroclor 1268	ND		0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCSW2
Lab ID:	58840-02
Date Received:	8/19/96
Date Prepared:	8/20/96
Date Analyzed:	8/20/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	112		50	150
Decachlorobiphenyl	131		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	23	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB711
Date Received:	-
Date Prepared:	8/20/96
Date Analyzed:	8/20/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	96		50	150
Decachlorobiphenyl	96		50	150

Analyte	Result (ug/100 cm ²)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB711
Date Prepared: 8/20/96
Date Analyzed: 8/20/96
QC Batch ID: PCB711

PCBs by USEPA Method 8080

Compound Name	Blank Result (ug/100 cm ²)	Spike Amount (ug/100 cm ²)	BS Result (ug/100 cm ²)	BS % Rec.	BSD Result (ug/100 cm ²)	BSD % Rec.	RPD
Aroclor 1260	0	5	5.35	107	5.35	107	0

SOUND ANALYTICAL SERVICES, INC.

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 • TELEPHONE 206-922-2310 • FAX 206-922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 22, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: McCarty

REPORT NUMBER: 58881

Enclosed are the test results for seven samples received at Sound Analytical Services on August 21, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

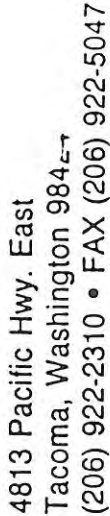
Analytical Narrative: The matrix spike duplicate recovery and the relative percent difference between the matrix spike duplicate were outside the Q.C. limits. The sample was nonhomogeneous, and no action was taken. The blank spike/blank spike duplicate were within the Q.C. limits.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager

DJP:tm



James & CHAI

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCN1
Lab ID:	58881-01
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	98.43

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	107		50	150
Decachlorobiphenyl	102		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.098	
Aroclor 1221	ND	0.098	
Aroclor 1232	ND	0.098	
Aroclor 1242	ND	0.098	
Aroclor 1248	ND	0.098	
Aroclor 1254	ND	0.098	
Aroclor 1260	1.6	0.098	
Aroclor 1262	ND	0.098	
Aroclor 1268	ND	0.098	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCNW1
Lab ID:	58881-02
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	91		50	150
Decachlorobiphenyl	89		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	11	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCNW2
Lab ID:	58881-03
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Analyte	Result (ug/100 cm ²)	PQL	Flags
Aroclor 1016	ND	10	
Aroclor 1221	ND	10	
Aroclor 1232	ND	10	
Aroclor 1242	ND	10	
Aroclor 1248	ND	10	
Aroclor 1254	ND	10	
Aroclor 1260	160	10	
Aroclor 1262	ND	10	
Aroclor 1268	ND	10	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCNW3
Lab ID:	58881-04
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Analyte	Result		PQL	Flags
	(ug/100 cm ²)			
Aroclor 1016	ND		25	
Aroclor 1221	ND		25	
Aroclor 1232	ND		25	
Aroclor 1242	ND		25	
Aroclor 1248	ND		25	
Aroclor 1254	ND		25	
Aroclor 1260		470	25	
Aroclor 1262	ND		25	
Aroclor 1268	ND		25	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCNW4
Lab ID:	58881-05
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080 .

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	94		50	150
Decachlorobiphenyl	91		50	150

Analyte	Result (ug/100 cm ²)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	7	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCNW4D
Lab ID:	58881-06
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	97		50	150
Decachlorobiphenyl	96		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	11	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCB1
Lab ID:	58881-07
Date Received:	8/21/96
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	89		50	150
Decachlorobiphenyl	88		50	150

Analyte	Result	PQL	Flags
	(ug/100 cm ²)		
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB715
Date Received:	-
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	102		50	150
Decachlorobiphenyl	100		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.097	
Aroclor 1221	ND	0.097	
Aroclor 1232	ND	0.097	
Aroclor 1242	ND	0.097	
Aroclor 1248	ND	0.097	
Aroclor 1254	ND	0.097	
Aroclor 1260	ND	0.097	
Aroclor 1262	ND	0.097	
Aroclor 1268	ND	0.097	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB715
Date Prepared: 8/21/96
Date Analyzed: 8/21/96
QC Batch ID: PCB715

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.913	0.976	107	1.03	107	0	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID: MCN1
Lab ID: 58881-01
Date Prepared: 8/21/96
Date Analyzed: 8/21/96
QC Batch ID: PCB715

PCBs by USEPA Method 8080

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1260	1.6	0.989	2.4	80.8	4.71	311	120	N

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB714
Date Received:	-
Date Prepared:	8/21/96
Date Analyzed:	8/21/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	93		50	150
Decachlorobiphenyl	104		50	150

Analyte	Result (ug/100 cm ²)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB714
Date Prepared: 8/21/96
Date Analyzed: 8/21/96
QC Batch ID: PCB714

PCBs by USEPA Method 8080

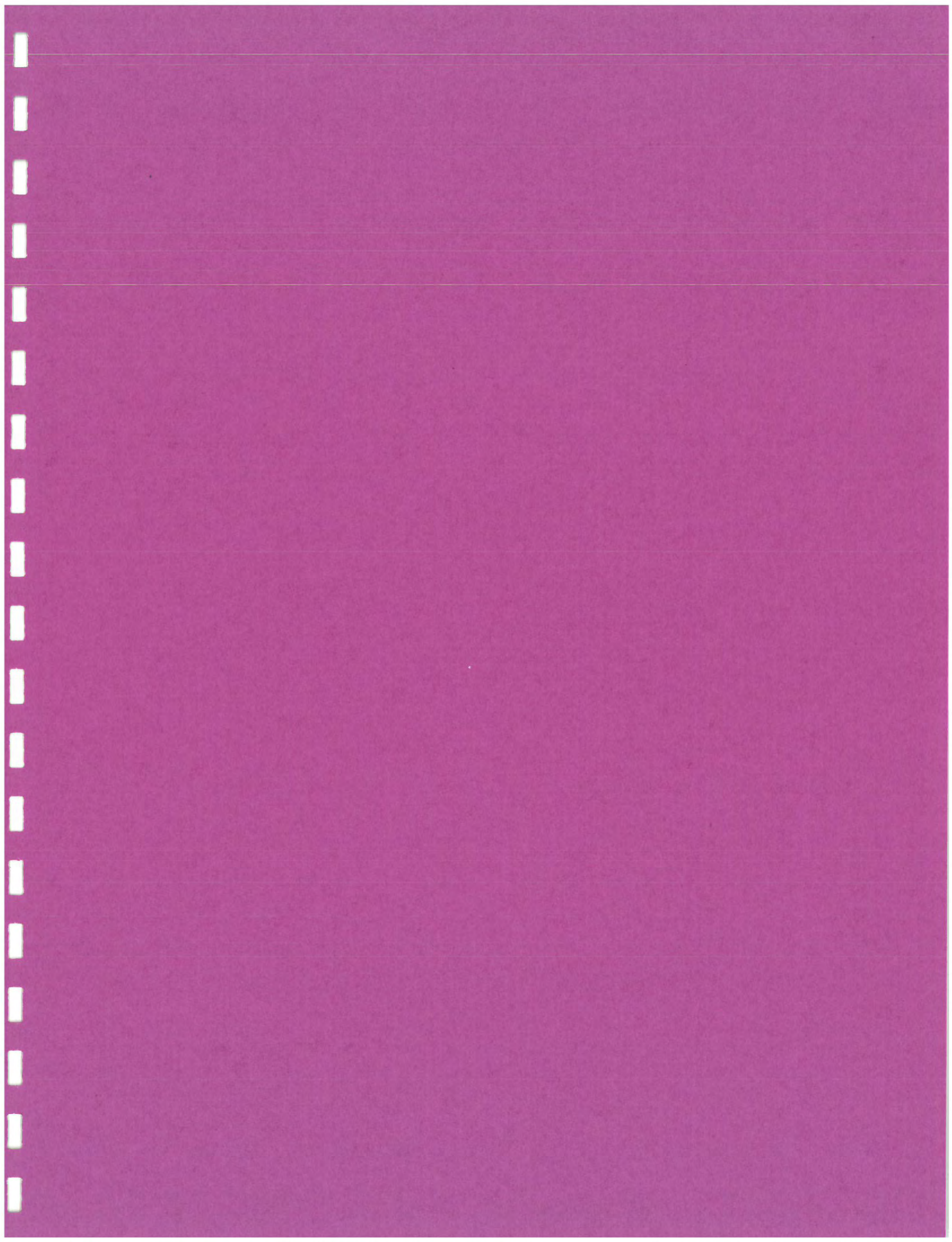
Compound Name	Blank Result (ug/100 cm ²)	Spike Amount (ug/100 cm ²)	BS Result (ug/100 cm ²)	BS % Rec.	BSD Result (ug/100 cm ²)	BSD % Rec.	RPD
Aroclor 1260	0	5	5.1	102	5.15	103	0.98

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
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- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
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- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 23, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 58894

Enclosed are the test results for one sample received at Sound Analytical Services on August 21, 1996.

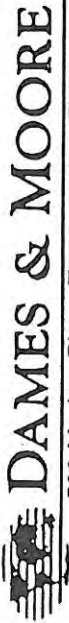
The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla Powell
Project Manager

DP:tm



Chain of Custody
 Date 8/21/96 Page 1 of 1

Project Manager: Lee Hatcher

Turn around time: 241 1-1/2

Sampler's Initials: _____

Sampler's Signature: _____

[illegible]

1000 JOURNAL OF CLIMATE

[illegible]

Relinquished by:

(Sig) Joseph H. H.
(Printed) SIEPHER H 174
(Company) DANES + MOORE
(Time) 1500 (Date) 8/21/76

Received by (lab):

(Sg) Don Nguyen
(Printed) Don Nguyen
(Company) SFB
(Time) 6:05 (Date) 2/21/77

Sample Receipt

Total no. of containers:	
Chain of custody seals:	
Rec'd good condition/cold:	
Conforms to record:	
Lab number:	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC14
Lab ID:	58894-01
Date Received:	8/21/96
Date Prepared:	8/22/96
Date Analyzed:	8/22/96
% Solids	99.28

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	9.6	
Aroclor 1221	ND	9.6	
Aroclor 1232	ND	9.6	
Aroclor 1242	ND	9.6	
Aroclor 1248	ND	9.6	
Aroclor 1254	ND	9.6	
Aroclor 1260	190	9.6	
Aroclor 1262	ND	9.6	
Aroclor 1268	ND	9.6	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB717
Date Received:	-
Date Prepared:	8/22/96
Date Analyzed:	8/22/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	100		50	150
Decachlorobiphenyl	89		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.096	
Aroclor 1221	ND	0.096	
Aroclor 1232	ND	0.096	
Aroclor 1242	ND	0.096	
Aroclor 1248	ND	0.096	
Aroclor 1254	ND	0.096	
Aroclor 1260	ND	0.096	
Aroclor 1262	ND	0.096	
Aroclor 1268	ND	0.096	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PCB717
Date Prepared:	8/22/96
Date Analyzed:	8/22/96
QC Batch ID:	PCB717

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.979	0.91	93	0.91	97	4.2	

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
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- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
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- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 26, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 58962

Enclosed are the test results for two samples received at Sound Analytical Services on August 23, 1996.

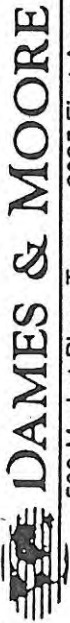
The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla Powell
Project Manager

DP:tm



DAMES & MOORE

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 8/23/96 Page 1 of 1

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC14D
Lab ID:	58962-01
Date Received:	8/23/96
Date Prepared:	8/24/96
Date Analyzed:	8/26/96
% Solids	99.46

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	1.9	
Aroclor 1221	ND	1.9	
Aroclor 1232	ND	1.9	
Aroclor 1242	ND	1.9	
Aroclor 1248	ND	1.9	
Aroclor 1254	ND	1.9	
Aroclor 1260	15	1.9	
Aroclor 1262	ND	1.9	
Aroclor 1268	ND	1.9	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC14D1
Lab ID:	58962-02
Date Received:	8/23/96
Date Prepared:	8/24/96
Date Analyzed:	8/26/96
% Solids	99.35

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	4.9	
Aroclor 1221	ND	4.9	
Aroclor 1232	ND	4.9	
Aroclor 1242	ND	4.9	
Aroclor 1248	ND	4.9	
Aroclor 1254	ND	4.9	
Aroclor 1260	49	4.9	
Aroclor 1262	ND	4.9	
Aroclor 1268	ND	4.9	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB721
Date Received:	-
Date Prepared:	8/24/96
Date Analyzed:	8/24/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	99		50	150
Decachlorobiphenyl	98		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.091	
Aroclor 1221	ND	0.091	
Aroclor 1232	ND	0.091	
Aroclor 1242	ND	0.091	
Aroclor 1248	ND	0.091	
Aroclor 1254	ND	0.091	
Aroclor 1260	ND	0.091	
Aroclor 1262	ND	0.091	
Aroclor 1268	ND	0.091	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB721
Date Prepared: 8/24/96
Date Analyzed: 8/24/96
QC Batch ID: PCB721

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.941	0.951	101	0.952	102	0.99	

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
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- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: August 29, 1996

TO: Lee Hatcher
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 59074

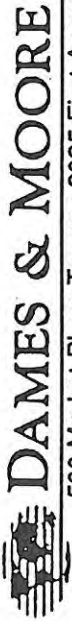
Enclosed are the test results for one sample received at Sound Analytical Services on August 29, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager



Chain of Custody
Date 8/29/17 Page 1 of 1

Project Number: 0681089-163
Project Manager: Lee Hatcher
Laboratory: Sound Analytics
Turn around time: RVSH

SJH
 Sampler's Initials: _____
 Sampler's Signature: _____

Sample ID	Date	Time	Matrix
MCC15	8/29/15	0815	50/L

Special instructions/Comments:
Call Steve Hinch with
estimate by noon.
Preliminary results
LY 3:30.
728-0744

(Signature) Stephen Hitch
 (Printed) Stephen Hitch
 (Company) DAMES & MOORE
 (Time) 0918 (Date) 3/29/22

Received by (lab):
(Sig) Mary Curtiss
(Printed) Mary Curtiss
(Company) SAS
(Time) 9:18 (Date) 8/28

Total no. of containers:	
Chain of custody seals:	
Rec'd good condition/cold:	
Conforms to record:	
b number:	

Analysis Request

[illegible][illegible]

Relinquished by:	Received by (lab):	Sample Receipt
(Sig) <u>Stephen Hitch</u>	(Sig) <u>Mary Curtis</u>	
(Printed) <u>Stephen Hitch</u>	(Printed) <u>Mary Curtis</u>	
(Company) <u>DAMES & MOORE</u>	(Company) <u>SAS</u>	
(Time) <u>0918</u> (Date) <u>8/29/96</u>	(Time) <u>9:18</u> (Date) <u>8/29/96</u>	
		Total no. of containers: Chain of custody seals: Rec'd good condition/cold: Conforms to record: Lab number:

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC15
Lab ID:	59074-01
Date Received:	8/29/96
Date Prepared:	8/29/96
Date Analyzed:	8/29/96
% Solids	99.6

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	123		50	150
Decachlorobiphenyl	124		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.097	
Aroclor 1221	ND	0.097	
Aroclor 1232	ND	0.097	
Aroclor 1242	ND	0.097	
Aroclor 1248	ND	0.097	
Aroclor 1254	ND	0.097	
Aroclor 1260	1.7	0.097	
Aroclor 1262	ND	0.097	
Aroclor 1268	ND	0.097	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB727
Date Received:	-
Date Prepared:	8/29/96
Date Analyzed:	8/29/96
% Solids	100

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	108		50	150
Decachlorobiphenyl	110		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Aroclor 1016	ND	0.099	
Aroclor 1221	ND	0.099	
Aroclor 1232	ND	0.099	
Aroclor 1242	ND	0.099	
Aroclor 1248	ND	0.099	
Aroclor 1254	ND	0.099	
Aroclor 1260	ND	0.099	
Aroclor 1262	ND	0.099	
Aroclor 1268	ND	0.099	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB727
Date Prepared: 8/29/96
Date Analyzed: 8/29/96
QC Batch ID: PCB727

PCBs by USEPA Method 8080

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	0.916	0.943	103	0.994	108	4.7	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	MCC15
Lab ID:	59074-01
Date Prepared:	8/29/96
Date Analyzed:	8/29/96
QC Batch ID:	PCB727

PCBs by USEPA Method 8080

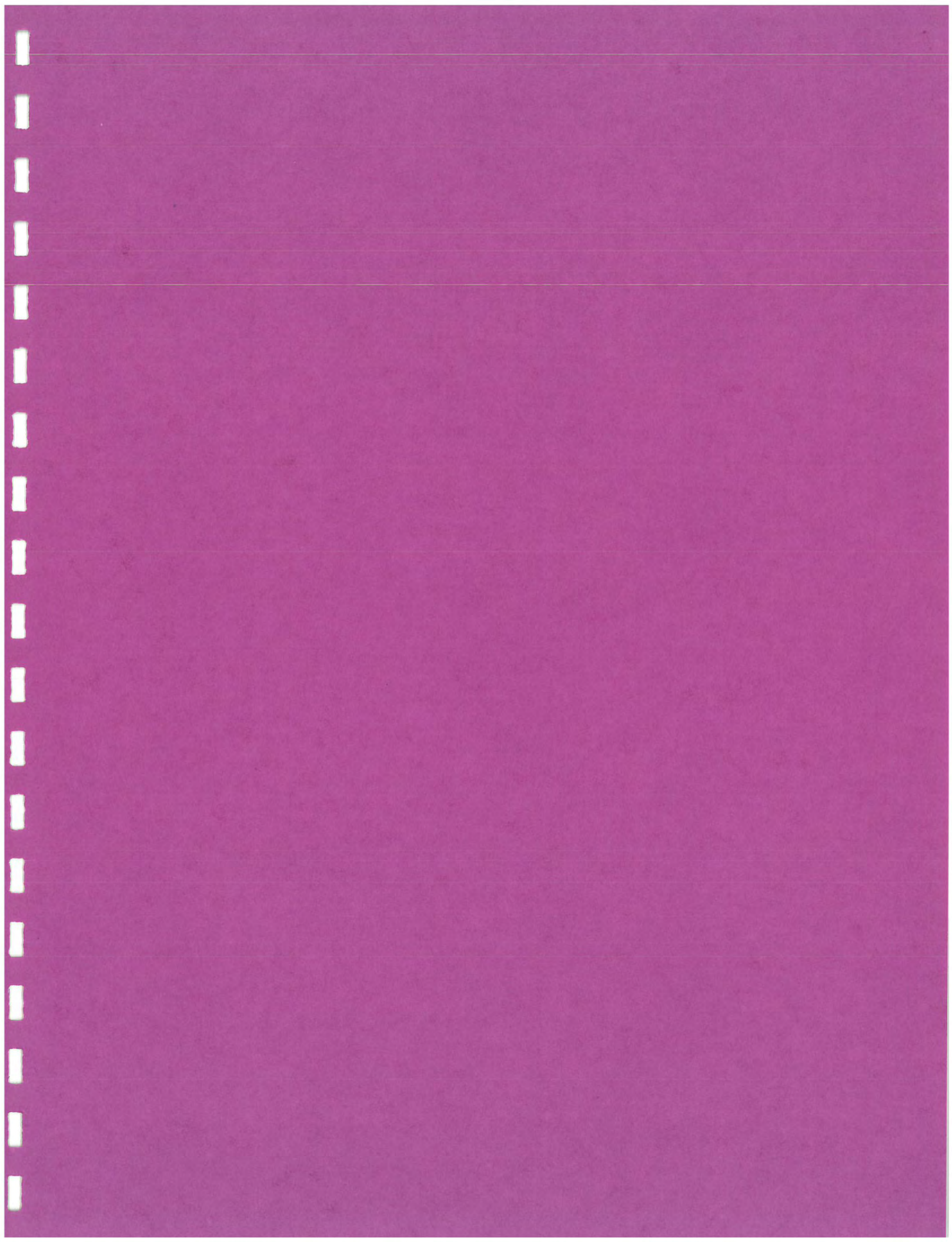
Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1260	1.7	0.978	2.53	82.3	2.42	73.7	11	

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

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- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.





Analytical Resources, Incorporated
Analytical Chemists and Consultants

3 September 1996

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-089-163, U of W;
ARI Job #: P957

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) records and results for samples from the above referenced project. Seventeen wipe samples were received in good condition on 8/28/96. There were no discrepancies between the COCs and sample labels, and they were logged into the laboratory without incident of note.

Analyses for PCBs were performed by EPA method 8081. They were routine, and these results were faxed to you earlier today. Note that samples MCSW5 and MCNW7 were reanalyzed at dilutions because aroclor-1260 concentrations were above the linear range of instrument calibration. Both sets of results are included.

A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

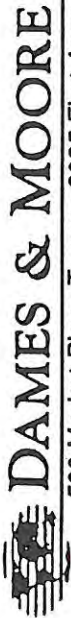
A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #P957



DAMES & MOORE
500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 8/28/96 Page 1 of 1[illegible]



Chain of Custody

Date 8/28/96 Page 1 of 1

Project Number: 00681-089-163

Project Manager: Lee Hatcher

Laboratory: $\frac{AR}{s}$

Turn around time:

Sampler's Initials:

Sampler's Signature:

Sample ID	Date	Time	Matrix
MCNW4	8/28/96	1544	WIRE
MCNW5	}	1546	}
MCNW6		1548	
MCNW7		1550	
MCNW8		1555	
MCNW9	}	1600	}

[illegible]

Special Instructions/Comments:

Relinquished by:

(Sig) XPR/6666
(Printed) Stephen H. Fitch
(Company) Dames + Moore
(Time) 1620 (Date) 8/28/96

Received by (lab):

(Sig) Mary Lou Fox
(Printed) Mary Lou Fox
(Company) ARI
(Time) 1620 (Date) 8/28/00

Sample Receipt

Total no. of containers:	
Chain of custody seals:	
Rec'd good condition/cold:	
Conforms to record:	

Lab number:



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW3

Lab Sample ID: P957A

QC Report No: P957-Dames & Moore

LIMS ID: 96-14165

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *[Signature]*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/30/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	7.0

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	61.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW4

Lab Sample ID: P957B

LIMS ID: 96-14166

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Heh*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/30/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	15

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	64.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW5

Lab Sample ID: P957C

LIMS ID: 96-14167

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Ag*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/30/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	26 E

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 94.0%

Tetrachlorometaxylene 66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW5

DILUTION

Lab Sample ID: P957CDIL

QC Report No: P957-Dames & Moore

LIMS ID: 96-14167

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Phyllis*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 09/02/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:5

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	5.0 U
53469-21-9	Aroclor 1242	5.0 U
12672-29-6	Aroclor 1248	5.0 U
11097-69-1	Aroclor 1254	5.0 U
11096-82-5	Aroclor 1260	35

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	85.0%
Tetrachlorometaxylene	95.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW6

Lab Sample ID: P957D

LIMS ID: 96-14168

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *High*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/30/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	10

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 78.0%

Tetrachlorometaxylene 67.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW7

Lab Sample ID: P957E

LIMS ID: 96-14169

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Phyllis*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/30/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	5.7

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 74.0%

Tetrachlorometaxylene 62.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW8

Lab Sample ID: P957F

QC Report No: P957-Dames & Moore

LIMS ID: 96-14170

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Phyllis*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/30/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst; confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW9

Lab Sample ID: P957G

LIMS ID: 96-14171

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *AKH*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/30/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.4

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 77.0%

Tetrachlorometaxylene 65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW10

Lab Sample ID: P957H

QC Report No: P957-Dames & Moore

LIMS ID: 96-14172

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *[Signature]*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/31/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.6

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW11

Lab Sample ID: P957I

LIMS ID: 96-14173

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *[Signature]*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSW12

Lab Sample ID: P957J

QC Report No: P957-Dames & Moore

LIMS ID: 96-14174

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Agg*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/31/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	4.8

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	56.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCSWB1

Lab Sample ID: P957K

LIMS ID: 96-14175

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Agg*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	60.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MENW~~ MCCW4

Lab Sample ID: P957L

QC Report No: P957-Dames & Moore

LIMS ID: 96-14176

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Agler*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/31/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	4.0

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	71.0%
Tetrachlorometaxylene	66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MCNWS~~ *MCCLW 5*

Lab Sample ID: P957M

LIMS ID: 96-14177

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *AKH*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	5.4

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 75.0%

Tetrachlorometaxylene 65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MEN-16~~ MCCW6

Lab Sample ID: P957N

LIMS ID: 96-14178

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Hepler*
Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	10

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	59.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MCMT~~ MLCW7

Lab Sample ID: P9570

LIMS ID: 96-14179

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *[Signature]*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	25 E

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 79.0%

Tetrachlorometaxylene 69.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MCNW7~~ MCCW7RE
DILUTION

Lab Sample ID: P9570DIL
LIMS ID: 96-14179
Matrix: Wipe

QC Report No: P957-Dames & Moore
Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Aggh*
Reported: 09/03/96

Date extracted: 08/29/96
Date analyzed: 09/02/96
Sample Amount: 1.00 Wipe
Final Ext Vol: 10 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:5

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	5.0 U
53469-21-9	Aroclor 1242	5.0 U
12672-29-6	Aroclor 1248	5.0 U
11097-69-1	Aroclor 1254	5.0 U
11096-82-5	Aroclor 1260	32

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 55.0%
Tetrachlorometaxylene 85.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MCW8~~ MCCW8

Lab Sample ID: P957P

LIMS ID: 96-14180

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Agda*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	14

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	75.0%
Tetrachlorometaxylene	62.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: ~~MCNWS~~ MCCW9

Lab Sample ID: P957Q

LIMS ID: 96-14181

Matrix: Wipe

QC Report No: P957-Dames & Moore

Project:

00681-089-163

Date Sampled: 08/28/96

Date Received: 08/28/96

Data Release Authorized: *Hygh*

Reported: 09/03/96

Date extracted: 08/29/96

Date analyzed: 08/31/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	3.8

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 72.0%

Tetrachlorometaxylene 63.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: P957MB

QC Report No: P957-Dames & Moore

LIMS ID: 96-14165

Project:

Matrix: Wipe

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized: *AKH*

Reported: 09/03/96

Date extracted: 08/29/96

GPC Cleanup: No

Date analyzed: 08/30/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	61.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: P957SB
LIMS ID: 96-14165
Matrix: Wipe

QC Report No: P957-Dames & Moore
Project: 00681-089-163

Data Release Authorized: *Phyllis*
Reported: 09/03/96

LABORATORY CONTROL SAMPLE RECOVERY

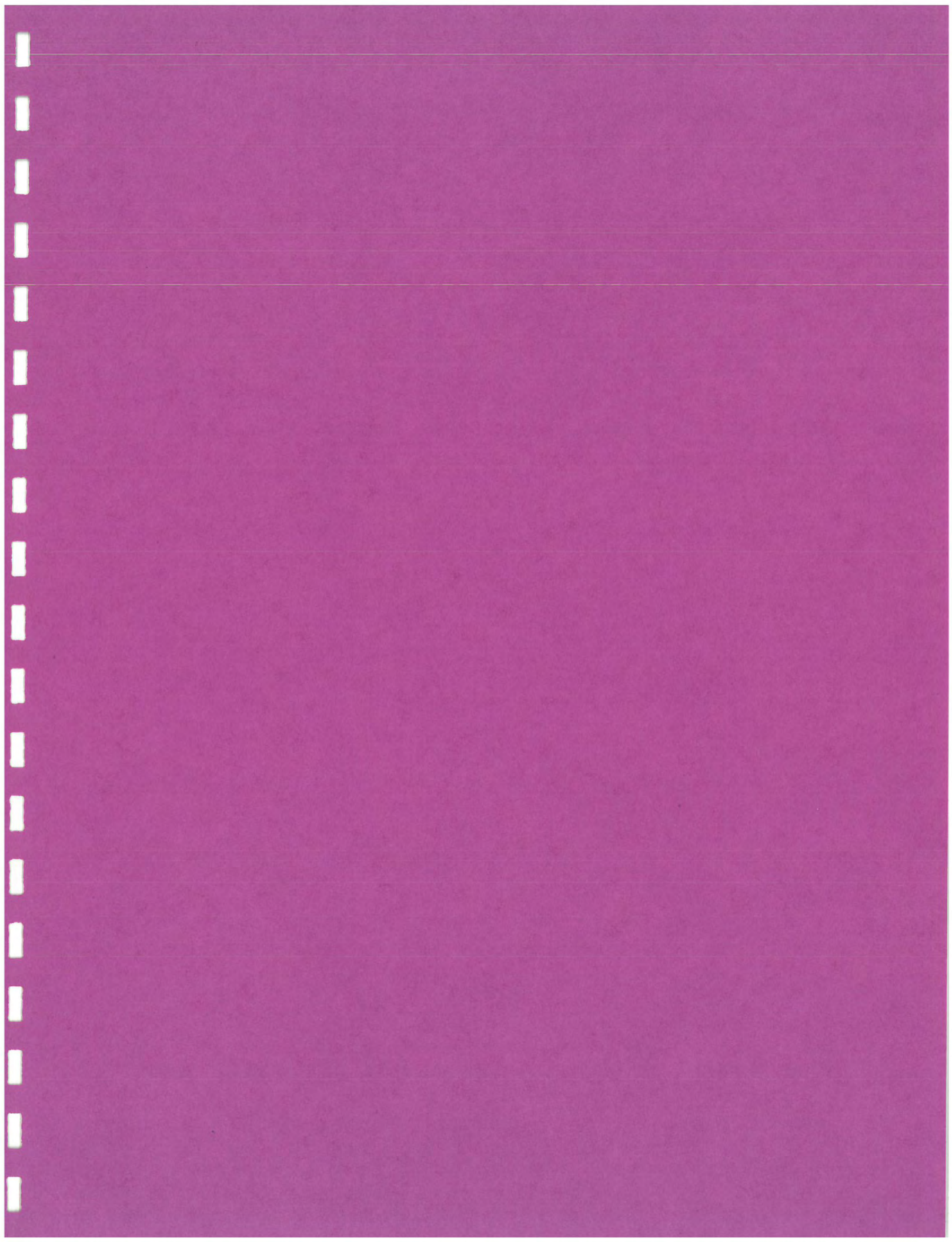
Date extracted: 08/29/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.05	10.0	60.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	75.0%
Tetrachlorometaxylene	69.0%

Values reported in ug/Sample





Analytical Resources, Incorporated
Analytical Chemists and Consultants

13 September 1996

RECEIVED
SEP 18 1996

 DAMES & MOORE
SEATTLE

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

**RE: Client Project: 00681-089-163, U of W;
ARI Job #: Q054**

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) record and results for samples from the above referenced project. Two wipe samples were received in good condition on 9/9/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note.

Analyses for PCBs were performed by EPA method 8081. They were routine, and these results were faxed to you earlier today. A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

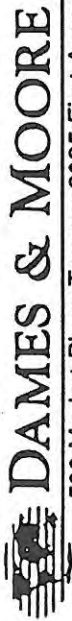
Sincerely,

ANALYTICAL RESOURCES, INC.



Kate Stegemöller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q054


$$57841-27817$$

Chain of Custody

Date 9/9/96 Page 1 of 1[illegible]



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCW101

Lab Sample ID: Q054A
LIMS ID: 96-14822
Matrix: Wipe

QC Report No: Q054-Dames & Moore
Project:

00681-089-163

Date Sampled: 09/07/96

Date Received: 09/09/96

Data Release Authorized:
Reported: 09/13/96

Cathy M. Newna

Date extracted: 09/12/96
Date analyzed: 09/12/96

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1

Sample Amount: 1.00 Wipe
Final Ext Vol: 10 mL

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	2.9

*sample taken in
switch gear @
McLarty Central
LH*

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 78.0%
Tetrachlorometaxylene 72.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCW102

Lab Sample ID: Q054B

QC Report No: Q054-Dames & Moore

LIMS ID: 96-14823

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 09/07/96

Date Received: 09/09/96

Data Release Authorized:

Reported: 09/13/96

Cathy M. Moore

Date extracted: 09/12/96

GPC Cleanup: No

Date analyzed: 09/12/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	12

*Sample taken
in switch gear
@ McCarty Central
JH*

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.0%
Tetrachlorometaxylene	58.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q054MB

QC Report No: Q054-Dames & Moore

LIMS ID: 96-14822

Project:

Matrix: Wipe

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 09/13/96

Cathy M. Hanna

Date extracted: 09/12/96

GPC Cleanup: No

Date analyzed: 09/12/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 74.0%

Tetrachlorometaxylene 75.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q054SB
LIMS ID: 96-14822
Matrix: Wipe

QC Report No: Q054-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 09/13/96

Cathy M. Kenna

LABORATORY CONTROL SAMPLE RECOVERY

Date extracted: 09/12/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.63	10.0	66.3%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	75.0%

Values reported in ug/Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

24 September 1996

RECEIVED
SEP 25 1996

DAMES & MOORE
SEATTLE

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-089-163, U of W;
ARI Job #: Q151

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) record and results for samples from the above referenced project. Fifteen wipe samples were received in good condition on 9/16/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note.

Analyses for PCBs were performed by EPA method 8081. They were routine, and initial results were faxed to you in preliminary form on 8/20, and the dilution results for four samples were faxed to you yesterday. Both sets of results for these four samples are included. A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

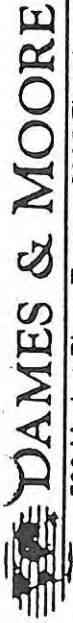
A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q151



Chain of Custody

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Date 9/16/96 Page 1 of 1

Project Information				Analysis Request										Sample Receipt			
Project Number: <u> </u>				Received by (lab):										Total no. of containers:			
Project Manager: <u>Lee Hatcher</u>				(Sig) <u>Mary Lou Fox</u>										Chain of custody seals:			
Laboratory: <u> </u>				(Printed) <u>Mary Lou Fox</u>										Rec'd good condition/cold:			
Turn around time: <u>3 days</u>				(Company) <u>APL</u>										Conforms to record:			
Sampler's Initials: <u>JVG</u>				(Time) <u>9/16/96</u> (Date) <u>1755</u>										Lab number:			
Sampler's Signature: <u>Joanne Yuen-Guo</u>																	
Sample ID	Date	Time	Matrix	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Base/Neutral/Acids 625/8270 (GC/MS)	BTX 602/8015	Polycyclic Aromatic Hydrocarbons 610/8310	Pesticides/PCBs 608/8080	Priority Pollutant Metals (13)	EP TOX Metals (8)	Comments/ Instructions	Number of Containers			
MEN101	9/16/96	1523	Wipe							X			* 10 on bottle	1			
MEN102	9/16/96	1525	Wipe							X			MENI 102 on bottle	1			
MEN102-DUP	9/16/96	1526	Wipe							X			10 M.A.N. DUP	1			
MEN103	9/16/96	1530	Wipe							X				1			
MEN104	9/16/96	1528	Wipe							X				1			
MCB101C	9/16/96	1625											1/10/96 on all	1			
MCB102C	9/16/96	1628											10's have MIEB	1			
MCB102C-DUP	9/16/96	1631											numbers	1			
MCB103C	9/16/96	1640												1			
MCB104C	9/16/96	1646											All times match	1			
MCB105C	9/16/96	1655											All samples labeled	1			
MCB106C	9/16/96	1700											with COC 10's	1			
MCB107C	9/16/96	1705											MIF	1			
MCB108C	9/16/96	1708											9/16/96	1			
Blank	9/16/96	16:10												1			

Special Instructions/Comments:

University of Washington
rates

Relinquished by:

(Sig) Joanne Yuen-Guo
(Printed) Joanne Yuen-Guo
(Company) DAMES & MOORE
(Time) 5:55 pm (Date) 9/16/96

Received by (lab):

(Sig) Mary Lou Fox
(Printed) Mary Lou Fox
(Company) APL
(Time) 9/16/96 (Date) 1755

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:
Lab number:



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCN101

Lab Sample ID: Q151A

LIMS ID: 96-15466

Matrix: Wipe

QC Report No: Q151-Dames & Moore

Project:

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *Agil*

Reported: 09/23/96

Date extracted: 09/18/96

Date analyzed: 09/19/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	2.3

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 64.0%

Tetrachlorometaxylene 63.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCN102

Lab Sample ID: Q151B

LIMS ID: 96-15467

Matrix: Wipe

QC Report No: Q151-Dames & Moore

Project:

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *Agla*

Reported: 09/23/96

Date extracted: 09/18/96

Date analyzed: 09/19/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	3.7

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 67.0%

Tetrachlorometaxylene 66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCN102-DUP

Lab Sample ID: Q151C

QC Report No: Q151-Dames & Moore

LIMS ID: 96-15468

Project:

Matrix: Wipe

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *Phyllis*

Reported: 09/23/96

Date extracted: 09/18/96

GPC Cleanup: No

Date analyzed: 09/20/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	4.7

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCN103

Lab Sample ID: Q151D

QC Report No: Q151-Dames & Moore

LIMS ID: 96-15469

Project:

Matrix: Wipe

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *[Signature]*

Reported: 09/23/96

Date extracted: 09/18/96

GPC Cleanup: No

Date analyzed: 09/20/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCN104

Lab Sample ID: Q151E

LIMS ID: 96-15470

Matrix: Wipe

QC Report No: Q151-Dames & Moore

Project:

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *[Signature]*

Reported: 09/23/96

Date extracted: 09/18/96

Date analyzed: 09/20/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.3

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 64.0%

Tetrachlorometaxylene 65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Blank

Lab Sample ID: Q151N

LIMS ID: 96-15480

Matrix: Wipe

QC Report No: Q151-Dames & Moore

Project:

Date Sampled: 09/16/96

Date Received: 09/16/96

Data Release Authorized: *[Signature]*

Reported: 09/23/96

Date extracted: 09/18/96

Date analyzed: 09/20/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	65.0%
Tetrachlorometaxylene	65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q151MB

QC Report No: Q151-Dames & Moore

LIMS ID: 96-15466

Project:

Matrix: Wipe

Date Sampled: NA

Date Received: NA

Data Release Authorized: *AKH*

Reported: 09/23/96

Date extracted: 09/18/96

GPC Cleanup: No

Date analyzed: 09/19/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	76.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q151SB
LIMS ID: 96-15466
Matrix: Wipe

QC Report No: Q151-Dames & Moore
Project:

Data Release Authorized:
Reported: 09/23/96

LABORATORY CONTROL SAMPLE RECOVERY

Date extracted: 09/18/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7.19	10.0	71.9%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	76.0%

Values reported in ug/Sample

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: September 25, 1996

TO: Steve Hitch
Dames & Moore

PROJECT: 00681-068-163

REPORT NUMBER: 59684

Enclosed are the test results for four samples received at Sound Analytical Services on September 24, 1996.

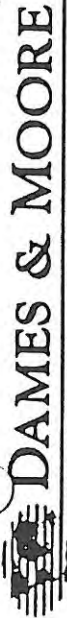
The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager

DJP:tm



Project Number: 00681-068-163
Project Manager: Lee Hotcher
Laboratory: Sound Analyst. & L
Turn around time: 24 HR

Sampler's Initials: SH
Sampler's Signature: [Signature]

Sample ID	Date	Time	Matrix
MCC 101	7/23/96	1600	WIPE
MCC 102	(1601	(
MCC 103)	1602)
MCC 104)	1603)

Analysis Request

[illegible]

Special Instructions/Comments:

24 HR RUSH FAX AM WED

Relinquished by:

Reinquished by: Stephen Hitch
(Sig) _____
(Printed) STEPHEN J HITCH _____
(Company) _____
(Time) _____ (Date) _____

Received by (lab):

(Sig) Mandla
(Printed) Mandla
(Company) SAS
(Time) 12:00 (Date) 9/24/16

Sample Receipt

Total no. of containers:	
Chain of custody seals:	
Rec'd good condition/cold:	
Conforms to record:	
b number:	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC101
Lab ID:	59684-01
Date Received:	9/24/96
Date Prepared:	9/24/96
Date Analyzed:	9/24/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	90		50	150
Decachlorobiphenyl	94		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	15	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC102
Lab ID:	59684-02
Date Received:	9/24/96
Date Prepared:	9/24/96
Date Analyzed:	9/24/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	90		50	150
Decachlorobiphenyl	95		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	12	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC103
Lab ID:	59684-03
Date Received:	9/24/96
Date Prepared:	9/24/96
Date Analyzed:	9/24/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	94		50	150
Decachlorobiphenyl	105		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	22	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC104
Lab ID:	59684-04
Date Received:	9/24/96
Date Prepared:	9/24/96
Date Analyzed:	9/24/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	95		50	150
Decachlorobiphenyl	103		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	26	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB742
Date Received:	-
Date Prepared:	9/24/96
Date Analyzed:	9/24/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	100		50	150
Decachlorobiphenyl	100		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB742
Date Prepared: 9/24/96
Date Analyzed: 9/24/96
QC Batch ID: PCB742

PCBs by USEPA Method 8080

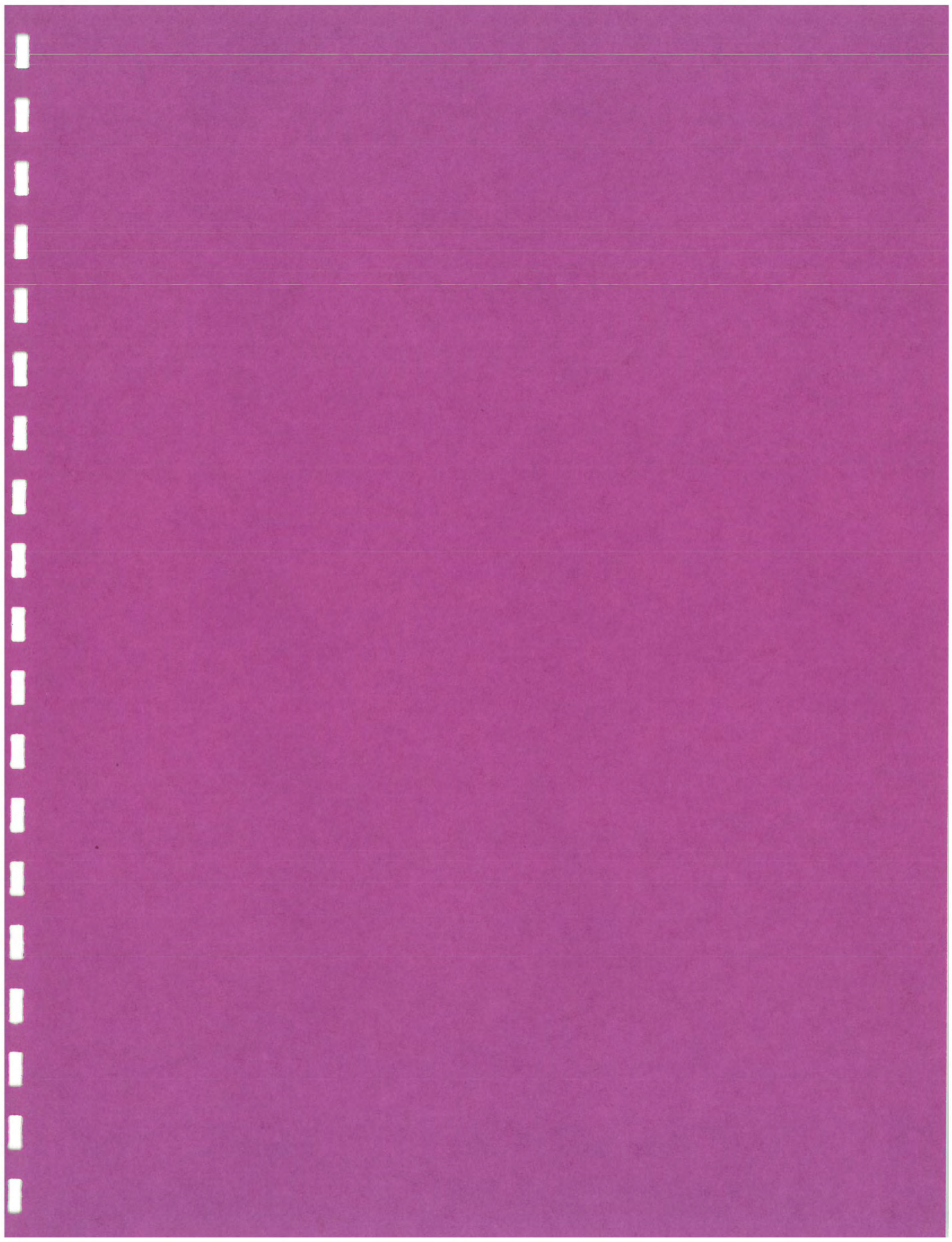
Compound Name	Blank Result (ug - total)	Spike Amount (ug - total)	BS Result (ug - total)	BS % Rec.	BSD Result (ug - total)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	5	5.6	112	5.35	107	4.6	

SOUND ANALYTICAL SERVICES, INC.

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DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: September 26, 1996

TO: Lee Hatcher
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 59762

Enclosed are the test results for two samples received at Sound Analytical Services on September 26, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla Powell
Project Manager

DP:tm

[illegible]

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC201
Lab ID:	59762-01
Date Received:	9/26/96
Date Prepared:	9/26/96
Date Analyzed:	9/26/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	129		50	150
Decachlorobiphenyl	106		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	3.3	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC202
Lab ID:	59762-02
Date Received:	9/26/96
Date Prepared:	9/26/96
Date Analyzed:	9/26/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	130		50	150
Decachlorobiphenyl	104		50	150

Analyte	Result		PQL	Flags
	(ug - total)			
Aroclor 1016	ND		0.5	
Aroclor 1221	ND		0.5	
Aroclor 1232	ND		0.5	
Aroclor 1242	ND		0.5	
Aroclor 1248	ND		0.5	
Aroclor 1254	ND		0.5	
Aroclor 1260		1.5	0.5	
Aroclor 1262	ND		0.5	
Aroclor 1268	ND		0.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:	Method Blank - PCB744
Date Received:	-
Date Prepared:	9/26/96
Date Analyzed:	9/26/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	101		50	150
Decachlorobiphenyl	101		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB744
Date Prepared: 9/26/96
Date Analyzed: 9/26/96
QC Batch ID: PCB744

PCBs by USEPA Method 8080

Compound Name	Blank Result (ug - total)	Spike Amount (ug - total)	BS Result (ug - total)	BS % Rec.	BSD Result (ug - total)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	5	5.2	104	5.25	105	0.96	

SOUND ANALYTICAL SERVICES, INC.

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 • TELEPHONE 206-922-2310 • FAX 206-922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: September 30, 1996

TO: Lee Hatcher
Dames & Moore

PROJECT: 00681-089-163

REPORT NUMBER: 59790

Enclosed are the test results for four samples received at Sound Analytical Services on September 26, 1996.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (206) 922-2310.

Sincerely,


Darla J. Powell
Project Manager

DJP:tm



DAMES & MOORE

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 9/12/09 Page 1 of 1

Project Number: 07681-009-11-3
Project Manager: LEE HATCHER
Laboratory: SAS
Turn around time: 24 hr

Sampler's Initials: FUB
Sampler's Signature: [Signature]

Sample ID	Date	Time	Matrix
1 MLL 301	9/12/09	12:10	Wipe
2 MLL 302	9/12/09	12:17	Wipe
3 MLL 303	9/12/09	12:14	Wipe
4 MLL 304	9/12/09	12:16	Wipe

Analysis Request

Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Base/Neutral/Acids 625/8270 (GC/MS)	BTX 602/8015	Polycyclic Aromatic Hydrocarbons 610/8310	Pesticides/PCBs 608/8080	Priority Pollutant Metals (13)	EP TOX Metals (8)	Comments/ Instructions	Number of Containers
						X			Wipe	1
						X			Wipe	1
						X			Wipe	1
						X			Wipe	1

Special Instructions/Comments:

Push (24 hr)
Fax Results Please
to Lee Hatcher

Relinquished by:

(Sig) [Signature]
(Printed) FUB BAKER
(Company) DAMES & MOORE
(Time) 13:30 (Date) 9/24/09

Received by (lab):

(Sig) [Signature]
(Printed) Mary Guntz
(Company) SAS
(Time) 4:00 (Date) 9/24/09

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:
Lab number:

9/24

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC 301
Lab ID:	59790-01
Date Received:	9/26/96
Date Prepared:	9/27/96
Date Analyzed:	9/27/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	96		50	150
Decachlorobiphenyl	111		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	23	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC 302
Lab ID:	59790-02
Date Received:	9/26/96
Date Prepared:	9/27/96
Date Analyzed:	9/27/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	100		50	150
Decachlorobiphenyl	101		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	9.6	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC 303
Lab ID:	59790-03
Date Received:	9/26/96
Date Prepared:	9/27/96
Date Analyzed:	9/27/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	103		50	150
Decachlorobiphenyl	119		50	150

Analyte	Result		PQL	Flags
	(ug - total)			
Aroclor 1016	ND		0.5	
Aroclor 1221	ND		0.5	
Aroclor 1232	ND		0.5	
Aroclor 1242	ND		0.5	
Aroclor 1248	ND		0.5	
Aroclor 1254	ND		0.5	
Aroclor 1260		15	0.5	
Aroclor 1262	ND		0.5	
Aroclor 1268	ND		0.5	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Dames & Moore
Client ID:	MCC 304
Lab ID:	59790-04
Date Received:	9/26/96
Date Prepared:	9/27/96
Date Analyzed:	9/27/96
% Solids	-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	50	150
Decachlorobiphenyl	-	X8	50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	2.5	
Aroclor 1221	ND	2.5	
Aroclor 1232	ND	2.5	
Aroclor 1242	ND	2.5	
Aroclor 1248	ND	2.5	
Aroclor 1254	ND	2.5	
Aroclor 1260	43	2.5	
Aroclor 1262	ND	2.5	
Aroclor 1268	ND	2.5	

SOUND ANALYTICAL SERVICES, INC.

Lab ID:
Date Received:
Date Prepared:
Date Analyzed:
% Solids

Method Blank - PCB746

-
9/27/96
9/27/96
-

PCBs by USEPA Method 8080

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	87		50	150
Decachlorobiphenyl	95		50	150

Analyte	Result (ug - total)	PQL	Flags
Aroclor 1016	ND	0.5	
Aroclor 1221	ND	0.5	
Aroclor 1232	ND	0.5	
Aroclor 1242	ND	0.5	
Aroclor 1248	ND	0.5	
Aroclor 1254	ND	0.5	
Aroclor 1260	ND	0.5	
Aroclor 1262	ND	0.5	
Aroclor 1268	ND	0.5	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike/Blank Spike Duplicate Report

Lab ID: PCB746
Date Prepared: 9/27/96
Date Analyzed: 9/27/96
QC Batch ID: PCB746

PCBs by USEPA Method 8080

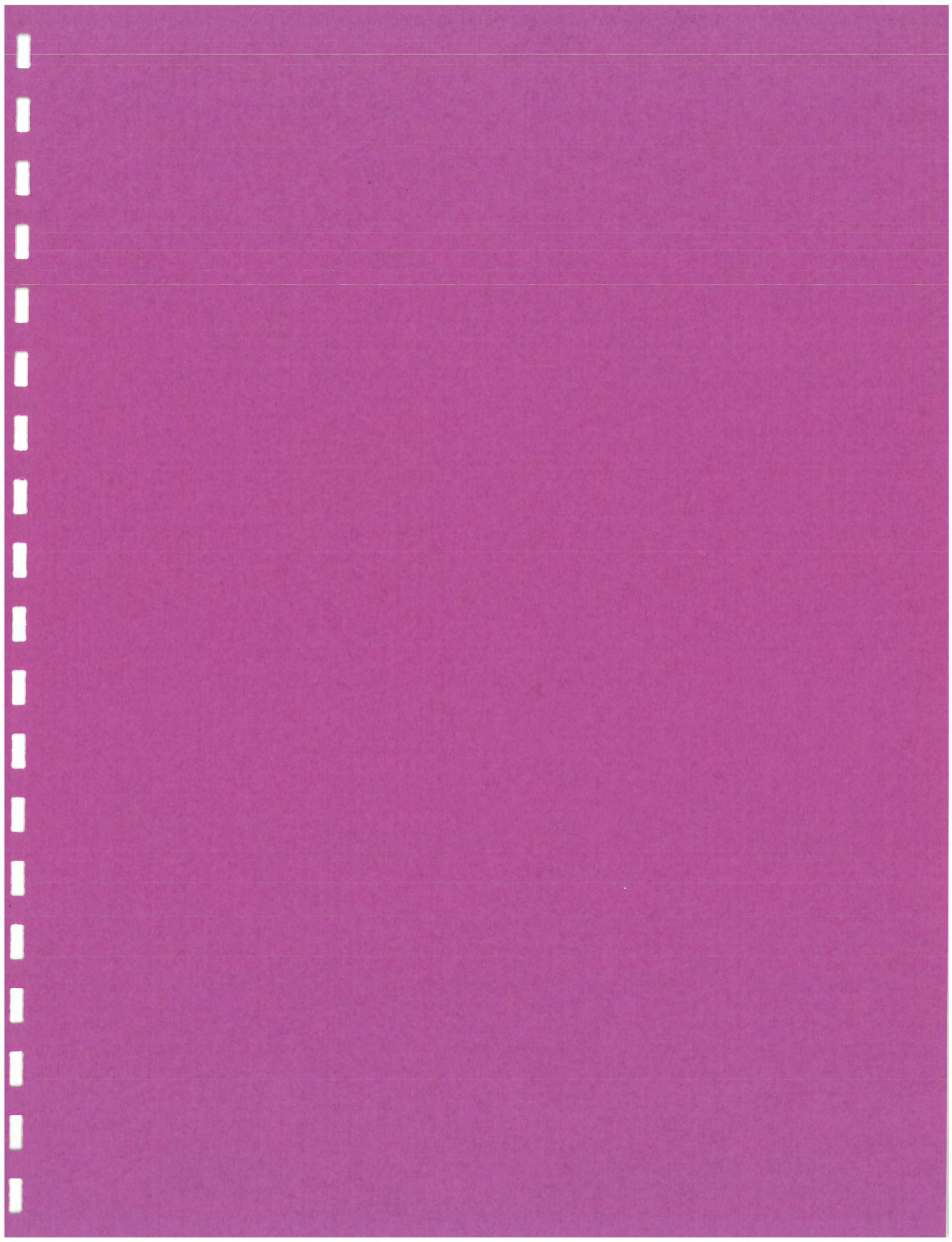
Compound Name	Blank Result (ug - total)	Spike Amount (ug - total)	BS Result (ug - total)	BS % Rec.	BSD Result (ug - total)	BSD % Rec.	RPD	Flag
Aroclor 1260	0	5	5.3	106	5.25	105	0.95	

SOUND ANALYTICAL SERVICES, INC.

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 • TELEPHONE 206-922-2310 • FAX 206-922-5047

DATA QUALIFIERS AND ABBREVIATIONS

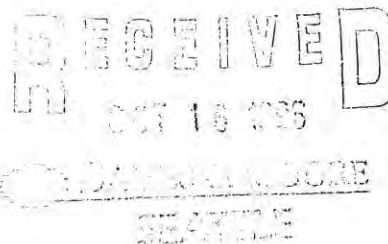
- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C: Additional confirmation performed.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.





Analytical Resources, Incorporated
Analytical Chemists and Consultants

15 October 1996



Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-089-163, U of W;
ARI Job #: Q408, parts I-III

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) record, faxed analysis requests, and final results for samples from the above referenced project. Eleven wipe samples were received in good condition on 10/8/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note.

As instructed, samples **MCC101A** and **MCC104A** were analyzed immediately, on a 24-hr TAT, for PCBs by method 8081. These analyses were routine, however sample **MCC104A** required reanalysis at dilution because the concentration of Aroclor-1260 was above the range of instrument calibration. Both sets of results are reported. These results were faxed to you and Joanne Yan-Gwo as soon as they became available. Upon receipt of a fax from Joanne on 10/9, analysis of samples **MCC105B** and **MCC107B** was initiated. These results were also faxed to you as soon as they were available. Finally, sample **MCC108C** was analyzed at your request, faxed on 10/11, and these results were faxed to you earlier today.

Method blanks and Laboratory Control Samples (LCS) were extracted and analyzed with each prep batch. LCS recovery reports are included to provide QC documentation for the project.

A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q408

Date 10/8/96 Page 1 of 1

11

Cont'd Exp.

S

Inner

Instructions

er of

[illegible]

	Sample Receipt
--	----------------

	Total no. of containers:	
	Chain of custody seals:	
	Rec'd good condition/cold:	
	Conforms to record:	

7/9/6

Received by (lab):

Received by (lab):

(Sig) <u>Mary Lou Fox</u>	Total no. of containers:
(Printed) <u>Mary Lou Fox</u>	Chain of custody seals:
(Company) <u>SPR I</u>	Rec'd good condition/cold:
(Time) <u>1145</u>	Conforms to record:
(Date) <u>10/8/96</u>	

	Sample Receipt
--	----------------

	Total no. of containers:	
	Chain of custody seals:	
	Rec'd good condition/cold:	
	Conforms to record:	



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC101A

Lab Sample ID: Q408A

LIMS ID: 96-17155

Matrix: Wipe

QC Report No: Q408-Dames & Moore

Project:

00681-089-163

Date Sampled: 10/08/96

Date Received: 10/08/96

Data Release Authorized: *[Signature]*

Reported: 10/09/96

Date extracted: 10/08/96

Date analyzed: 10/08/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	7.5

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	62.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC104A

Lab Sample ID: Q408B

LIMS ID: 96-17156

Matrix: Wipe

QC Report No: Q408-Dames & Moore

Project:

00681-089-163

Date Sampled: 10/08/96

Date Received: 10/08/96

Data Release Authorized: *[Signature]*

Reported: 10/09/96

Date extracted: 10/08/96

Date analyzed: 10/08/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	22 E

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 71.0%

Tetrachlorometaxylene 56.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC104A

DILUTION

Lab Sample ID: Q408BDIL

QC Report No: Q408-Dames & Moore

LIMS ID: 96-17156

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 10/08/96

Date Received: 10/08/96

Data Release Authorized: *[Signature]*

Reported: 10/09/96

Date extracted: 10/08/96

GPC Cleanup: No

Date analyzed: 10/09/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:2

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	2.0 U
53469-21-9	Aroclor 1242	2.0 U
12672-29-6	Aroclor 1248	2.0 U
11097-69-1	Aroclor 1254	2.0 U
11096-82-5	Aroclor 1260	23

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	58.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC105B

Lab Sample ID: Q408E

LIMS ID: 96-17159

Matrix: Wipe

QC Report No: Q408-Dames & Moore

Project:

00681-089-163

Date Sampled: 10/08/96

Date Received: 10/09/96

Data Release Authorized:

Reported: 10/10/96

Catharine M. Hewner

Date extracted: 10/10/96

Date analyzed: 10/10/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	6.9

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 66.0%

Tetrachlorometaxylene 60.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC107B

Lab Sample ID: Q408G

QC Report No: Q408-Dames & Moore

LIMS ID: 96-17161

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 10/09/96

Date Received: 10/08/96

Data Release Authorized:

Reported: 10/10/96

Catherine Newsum

Date extracted: 10/10/96

GPC Cleanup: No

Date analyzed: 10/10/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	15

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	61.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC108C

Lab Sample ID: Q408H

LIMS ID: 96-17162

Matrix: Wipe

QC Report No: Q408-Dames & Moore

Project:

00681-089-163

Date Sampled: 10/08/96

Date Received: 10/08/96

Data Release Authorized:

Reported: 10/15/96

Carl M. Newman

Date extracted: 10/14/96

Date analyzed: 10/14/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	5.7

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 63.0%

Tetrachlorometaxylene 59.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q408MB

LIMS ID: 96-17155

Matrix: Wipe

QC Report No: Q408-Dames & Moore

Project:

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized: *High*

Reported: 10/09/96

Date extracted: 10/08/96

Date analyzed: 10/08/96

Sample Amount: 1.00 Wipe

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	88.0%
Tetrachlorometaxylene	88.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q408SB
LIMS ID: 96-17155
Matrix: Wipe

QC Report No: Q408-Dames & Moore
Project: 00681-089-163

Data Release Authorized: *Agf*
Reported: 10/09/96

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 10/08/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.82	10.0	68.2%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	82.0%
Tetrachlorometaxylene	82.0%

Values reported in ug/Sample



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q408MB

QC Report No: Q408-Dames & Moore

LIMS ID: 96-17159

Project:

Matrix: Wipe

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 10/10/96

Date extracted: 10/10/96

GPC Cleanup: No

Date analyzed: 10/10/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	70.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q408SB
LIMS ID: 96-17159
Matrix: Wipe

QC Report No: Q408-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 10/10/96

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 10/10/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.82	10.0	68.2%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	83.0%
Tetrachlorometaxylene	85.0%

Values reported in ug/Sample



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q408MB

QC Report No: Q408-Dames & Moore

LIMS ID: 96-17162

Project:

Matrix: Wipe

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 10/15/96

Date extracted: 10/14/96

GPC Cleanup: No

Date analyzed: 10/14/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.0%
Tetrachlorometaxylene	71.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q408SB
LIMS ID: 96-17162
Matrix: Wipe

QC Report No: Q408-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 10/15/96

Catherine M. Newman

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 10/14/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	5.90	10.0	59.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	72.0%

Values reported in ug/Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

29 October 1996

RECEIVED
OCT 30 1996

DAMES & MOORE
SEATTLE

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-088, U of W;
ARI Job #: Q617

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) record and results for samples from the above referenced project. Three wipe samples were received in good condition on 10/25/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note. Sample MCC-402-A was put on "hold" status pending the results of MCC-401, as instructed on the COC.

Analyses for PCBs were performed by EPA method 8081. They were routine, and these results were faxed to you earlier today. Note that sample MCC-401 required reanalysis at a dilution because the instrument detector was saturated with aroclor-1260 when initially analyzed. Both sets of results are reported.

A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

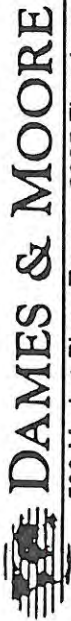
A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q617



DAMES & MOORE
500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

0617

Chain of Custody

Date 01/25/96 Page 1 of _____[illegible]

- Analyze, MCC to I for PBS if $PBS > 10 \text{ mg/l}$ $f_{\text{P}}: c - \text{by} - \text{PCC} - 1 - 7 - 1$



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Blank

Lab Sample ID: Q617A

QC Report No: Q617-Dames & Moore

LIMS ID: 96-18378

Project:

Matrix: Wipes

00681-088

Date Sampled: 10/25/96

Date Received: 10/25/96

Data Release Authorized:

Reported: 10/29/96

Date extracted: 10/28/96

GPC Cleanup: No

Date analyzed: 10/28/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipes

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	67.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-401

Lab Sample ID: Q617B

LIMS ID: 96-18379

Matrix: Wipes

QC Report No: Q617-Dames & Moore

Project:

00681-088

Date Sampled: 10/25/96

Date Received: 10/25/96

Data Release Authorized:

Reported: 10/29/96

Cathryn M. Newna

Date extracted: 10/28/96

Date analyzed: 10/28/96

Sample Amount: 1.00 Wipes

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	S
11096-82-5	Aroclor 1260	S

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	61.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-401
DILUTION

Lab Sample ID: Q617BDIL
LIMS ID: 96-18379
Matrix: Wipes

QC Report No: Q617-Dames & Moore
Project:

00681-088

Date Sampled: 10/25/96

Date Received: 10/25/96

Data Release Authorized:
Reported: 10/29/96

Catherine Harnes

Date extracted: 10/28/96
Date analyzed: 10/28/96
Sample Amount: 1.00 Wipes
Final Ext Vol: 10 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:50

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	50 U
53469-21-9	Aroclor 1242	50 U
12672-29-6	Aroclor 1248	50 U
11097-69-1	Aroclor 1254	50 U
11096-82-5	Aroclor 1260	430

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q617MB

QC Report No: Q617-Dames & Moore

LIMS ID: 96-18378

Project:

Matrix: Wipes

00681-088

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 10/29/96

William M. Newna

Date extracted: 10/28/96

GPC Cleanup: No

Date analyzed: 10/28/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipes

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 84.0%

Tetrachlorometaxylene 76.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q617SB
LIMS ID: 96-18378
Matrix: Wipes

QC Report No: Q617-Dames & Moore

Project:

00681-088

Data Release Authorized:
Reported: 10/29/96

C. M. H. H. H.

LABORATORY CONTROL SAMPLE RECOVERY

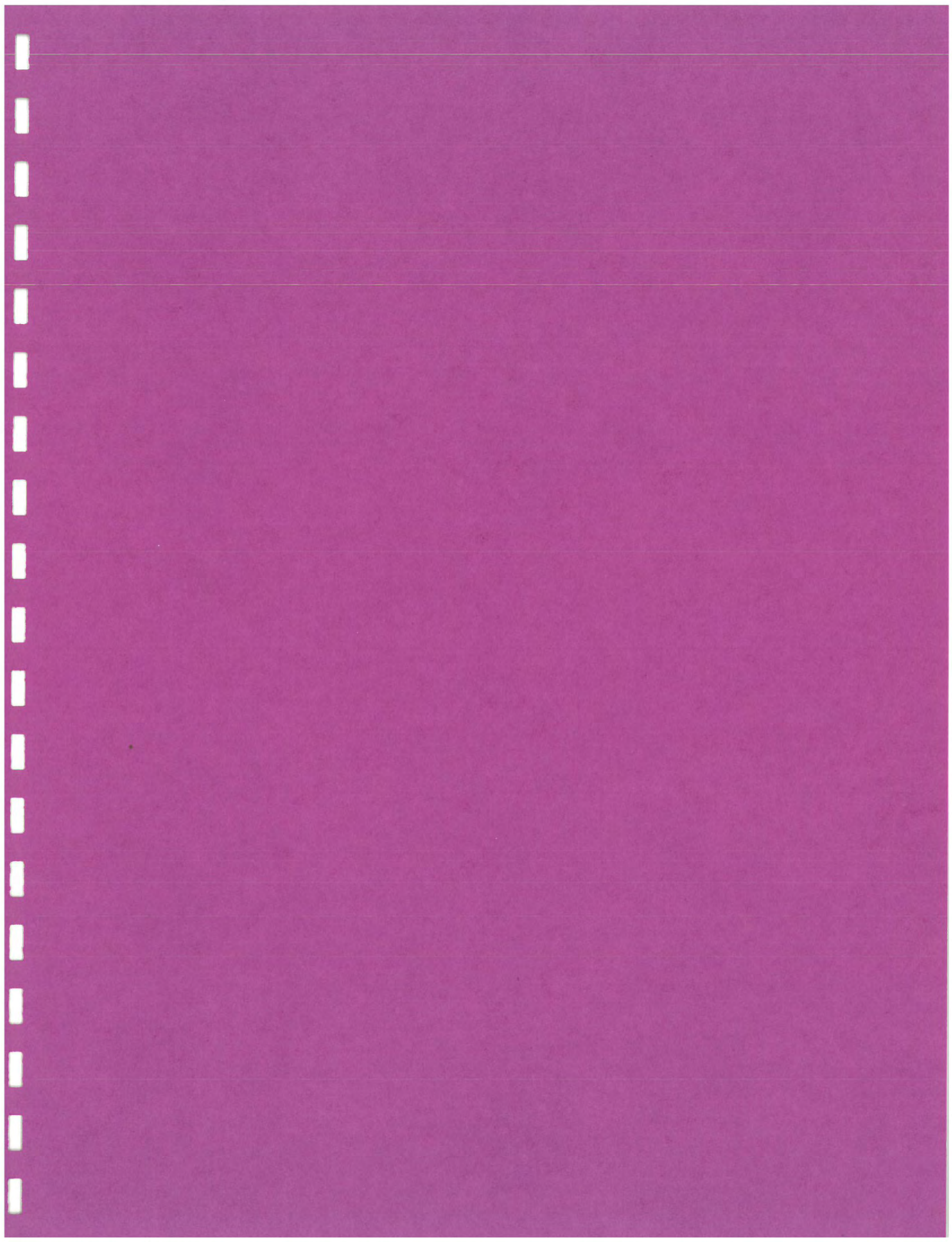
Date extracted: 10/28/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.84	10.0	68.4%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	80.0%

Values reported in ug/Sample





Analytical Resources, Incorporated
Analytical Chemists and Consultants

31 October 1996

RECEIVED
NOV 05 1996

DAMES & MOORE
SEATTLE

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-088, U of W;
ARI Job #: Q617 II

Dear Mr. Hatcher,

Please find enclosed the faxed request for analysis and results for a sample from the above referenced project. Three wipe samples were originally received in good condition on 10/25/96. Two of them were analyzed immediately, the results for which were submitted to you yesterday.

Upon receipt of the enclosed fax, sample MCC-402A was taken off "hold" status and analyzed for PCBs by EPA method 8081. The analysis was routine, and these results were faxed to Joanne and P. May earlier today.

A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stagemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q617



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-402A

Lab Sample ID: Q617C

QC Report No: Q617-Dames & Moore

LIMS ID: 96-18380

Project:

Matrix: Wipes

00681-088

Date Sampled: 10/25/96

Date Received: 10/29/96

Data Release Authorized:

Reported: 10/31/96

Cathy M. Newman

Date extracted: 10/30/96

GPC Cleanup: No

Date analyzed: 10/30/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipes

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	5.7

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 62.0%

Tetrachlorometaxylene 56.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q617MB

QC Report No: Q617-Dames & Moore

LIMS ID: 96-18380

Project:

Matrix: Wipes

00681-088

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 10/31/96

Catherine Hume

Date extracted: 10/30/96

GPC Cleanup: No

Date analyzed: 10/30/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipes

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	71.0%
Tetrachlorometaxylene	67.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q617SB
LIMS ID: 96-18380
Matrix: Wipes

QC Report No: Q617-Dames & Moore
Project: 00681-088

Data Release Authorized:
Reported: 10/31/96

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 10/30/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	6.60	10.0	66.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	69.0%

Values reported in ug/Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

8 November 1996

RECEIVED
NOV 12 1996
DAMES & MOORE
SEATTLE

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-088, U of W;
ARI Job #: Q699

Dear Mr. Hatcher,

Please find enclosed the original chain-of-custody (COC) record and results for samples from the above referenced project. Five wipe samples were received in good condition on 11/5/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note.

Analyses for PCBs were performed by EPA method 8081. They were routine, and these results were faxed to P.May Vichitkulwongsa earlier today. There were no dilutions or reanalyses required.

A Laboratory Control Sample was extracted and analyzed with the samples, and a recovery report is included to provide QC documentation for the project.

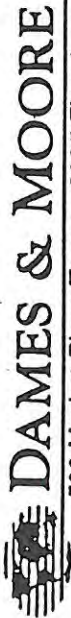
A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemöller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q699



DAMES & MOORE
500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 11/5/16 Page 1 of 1[illegible]

P. May 1st - little red - up - ..



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC 50B

Lab Sample ID: Q699A

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18823

Project:

Matrix: WIPES

00681-089-163

Date Sampled: 11/05/96

Date Received: 11/05/96

Data Release Authorized: *Carlton M. Neuma*

Reported: 11/08/96

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	61.0%
Tetrachlorometaxylene	59.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC 501

Lab Sample ID: Q699B

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18824

Project:

Matrix: WIPES

00681-089-163

Date Sampled: 11/05/96

Date Received: 11/05/96

Data Release Authorized:

Reported: 11/08/96

Carl M. Newner

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	6.5

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.0%
Tetrachlorometaxylene	64.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC 502

Lab Sample ID: Q699C

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18825

Project:

Matrix: WIPES

00681-089-163

Date Sampled: 11/05/96

Date Received: 11/05/96

Data Release Authorized:

Reported: 11/08/96

C. M. Newman

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.9

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	62.0%
Tetrachlorometaxylene	64.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC 503

Lab Sample ID: Q699D

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18826

Project:

Matrix: WIPES

00681-089-163

Date Sampled: 11/05/96

Date Received: 11/05/96

Data Release Authorized:

Reported: 11/08/96

Carl M. Newman

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	11

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.0%
Tetrachlorometaxylene	65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC 504

Lab Sample ID: Q699E

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18827

Project:

Matrix: WIPES

00681-089-163

Date Sampled: 11/05/96

Date Received: 11/05/96

Data Release Authorized:

Reported: 11/08/96

William M. Moore

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	4.4

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	61.0%
Tetrachlorometaxylene	62.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: Q699MB

QC Report No: Q699-Dames & Moore

LIMS ID: 96-18823

Project:

Matrix: WIPES

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 11/08/96

William M. Newman

Date extracted: 11/05/96

GPC Cleanup: No

Date analyzed: 11/05/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 1.00 WIPES

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	74.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: Q699SB
LIMS ID: 96-18823
Matrix: WIPES

QC Report No: Q699-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 11/08/96

Cathy M. Newman

LABORATORY CONTROL SAMPLE RECOVERY

Date extracted: 11/05/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7.09	10.0	70.9%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	72.0%

Values reported in ug/Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

11 December 1996

RECEIVED
DEC 12 1996

DAMES & MOORE
SEATTLE

P. May Vichitkulwongsa
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: 00681-089-163
ARI Job #: R021

Dear May:

Please find enclosed the original Chain-of-Custody (COC) record and final results for samples from the above referenced project. Two wipe samples were received in good condition on 12/9/96. There were no discrepancies between the COC and sample labels, and they were logged into the laboratory without incident of note. All samples were analyzed for PCBs as requested.

Both samples were initially analyzed on 12/10/96. The calibration standards from that day did not meet acceptance criteria. Verbal results were provided based on those analyses. A new calibration curve was established and the samples were re-analyzed. The re-analyses proceeded without incident of note. The results for the re-analyses only have been submitted for these samples.

A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206-340-2866, ext. 113

Enclosures
cc: file #R021
MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 1
 Number of coolers: 1
 Cooler Temp: ambient
 Rad. Survey: background



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Dawes & Moore Phone#: 728-0744

Client Contact: P. May Vitalkalwansa

Client Project ID: 00681-089-163

Samplers: P. May

Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required	Notes/Comments
1	12/19/96	11:00 am	wipe	1		PCR	
2	12/19/96			1		X	
3							
4							
5							
6							
7							

ARI Project No: 12021

Comments/Special Instructions:

1 day turn around

time, please call

ASTS

Relinquished by: [Signature]
 (Signature)

Printed Name: P. May Vitalkalwansa

Company: D & M

Date: 12/19/96 Time: 1:35

Received by: [Signature]
 (Signature)

Printed Name: Jason Savat

Company:

Date: 12/19/96 Time: 1:35

Relinquished by: [Signature]
 (Signature)

Printed Name:

Company:

Date: Time:

Received by: [Signature]
 (Signature)

Printed Name:

Company:

Date: Time:

Relinquished by: [Signature]
 (Signature)

Printed Name:

Company:

Date: Time:

Received by: [Signature]
 (Signature)

Printed Name:

Company:

Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: R021MB

QC Report No: R021-Dames & Moore

LIMS ID: 96-21042

Project:

Matrix: Wipe

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 12/11/96

Callie M. Newner

Date extracted: 12/09/96

GPC Cleanup: No

Date analyzed: 12/10/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 91.0%
Tetrachlorometaxylene 74.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-601

Lab Sample ID: R021A
LIMS ID: 96-21042
Matrix: Wipe

QC Report No: R021-Dames & Moore
Project:

00681-089-163

Date Sampled: 12/09/96

Date Received: 12/09/96

Data Release Authorized:
Reported: 12/11/96

Alt. H. New

Date extracted: 12/09/96
Date analyzed: 12/10/96
Sample Amount: 1.00 Wipe
Final Ext Vol: 10 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	S
11096-82-5	Aroclor 1260	S
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 128%
Tetrachlorometaxylene 62.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-601

DILUTION

Lab Sample ID: R021ADIL
LIMS ID: 96-21042
Matrix: Wipe

QC Report No: R021-Dames & Moore
Project:

00681-089-163

Date Sampled: 12/09/96

Date Received: 12/09/96

Data Release Authorized:
Reported: 12/11/96

Date extracted: 12/09/96
Date analyzed: 12/10/96
Sample Amount: 1.00 Wipe
Final Ext Vol: 10 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:100

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	100 U
53469-21-9	Aroclor 1242	100 U
12672-29-6	Aroclor 1248	100 U
11097-69-1	Aroclor 1254	100 U
11096-82-5	Aroclor 1260	990
11104-28-2	Aroclor 1221	200 U
11141-16-5	Aroclor 1232	100 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-Blank

Lab Sample ID: R021B

QC Report No: R021-Dames & Moore

LIMS ID: 96-21043

Project:

Matrix: Wipe

00681-089-163

Date Sampled: 12/09/96

Date Received: 12/09/96

Data Release Authorized:

Reported: 12/11/96

Call M. Hume

Date extracted: 12/09/96

GPC Cleanup: No

Date analyzed: 12/10/96

Florisil Cleanup: No

Sample Amount: 1.00 Wipe

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	104%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: R021SB
LIMS ID: 96-21042
Matrix: Wipe

QC Report No: R021-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 12/11/96

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 12/09/96

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7.70	10.0	77.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	91.0%
Tetrachlorometaxylene	85.0%

Values reported in ug/Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

17 December 1996

P. May Vichitkulwongsa
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RECEIVED
DEC 18 1996
DAMES & MOORE
SEATTLE

RE: Client Project: 00681-089-163
ARI Job #R118

Dear May:

Please find enclosed the original Chain-of-Custody (COC) record and final results for samples from the above referenced project. Five wipe samples and two concrete samples were received in good condition on 12/13/96. The samples identified on the COC as MEB-100 and MEB-101 were associated with sample jars that were labeled MCC-100 and MCC-101, respectively. Based on the nomenclature of the remaining wipe samples, these two samples were logged in per the IDs on the COC. All samples were analyzed for PCBs as requested.

A very high level of Aroclor 1260 was detected in both concrete samples following their initial analyses. Both samples were diluted and re-analyzed. The re-analyses of Sample MCCC-02 confirmed that Aroclor 1260 was present in this sample and was not the results of carryover from Sample MCCC-01. The results for the initial analyses and the dilutions have been submitted for these samples.

A copy of this package will be kept on file should you need additional information at a future date. If you have questions or need additional documentation, please call me any time.

Sincerely,

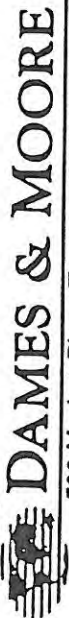
ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206-340-2866, ext. 113

Enclosures

cc: file #R118

MDH/mdh



500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 2/13/96 Page 1 of 1

Project Number: 00681-089-163

Project Manager: Lee Hatcher

Laboratory: ARI

um around time: 21 day

PMV

Amplifier's Initials: QZ

[illegible]

Special Instructions/Comments:

Please call P. May @

723-0744 ASK

...

tax results to 727

UW Rate

Belinavished by:		
------------------	--	--

consequence of:

① 11-15 0

(Sig) D. J. Tuckwell

(Printed) P. May Vidutskulworn

(Company) Dave & Moore
15.13 1.11

(Time) 15:13 (Date) 21/3/91

Received by (Lab):			
--------------------	--	--	--

received by (lab).

(Sig) any for 14

(Printed) Mary Lou Fox

(Company) ARI

(Time) 1513 (Date) 12/13/96

Analysis Request

[illegible]

	Sample Decent
--	---------------

sample receipt

Total no. of containers:

Chain of custody seals:

Conforms to record:

number:



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: R118MB
LIMS ID: 96-21713
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project: 00681-089-163

Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/17/96

Date extracted: 12/16/96
Date analyzed: 12/16/96

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1

Sample Amount: 30.0 g-as-rec
Final Ext Vol: 10 mL

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 80.0%
Tetrachlorometaxylene 79.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01

Lab Sample ID: R118F

QC Report No: R118-Dames & Moore

LIMS ID: 96-21713

Project:

Matrix: Concrete

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:

Reported: 12/17/96

Callie M. Newme

Date extracted: 12/16/96

GPC Cleanup: No

Date analyzed: 12/16/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 30.0 g-as-rec

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	880 Y
53469-21-9	Aroclor 1242	880 Y
12672-29-6	Aroclor 1248	S
11097-69-1	Aroclor 1254	S
11096-82-5	Aroclor 1260	S
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	880 Y

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl NR
Tetrachlorometaxylene 57.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01
DILUTION

Lab Sample ID: R118FDIL
LIMS ID: 96-21713
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project:

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:
Reported: 12/17/96

Date extracted: 12/16/96
Date analyzed: 12/16/96

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes

Sample Amount: 30.0 g-as-rec
Final Ext Vol: 10 mL

Sulfur Cleanup: No
Conc/Dilution Factor: 1:25000

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	830,000 U
53469-21-9	Aroclor 1242	830,000 U
12672-29-6	Aroclor 1248	830,000 U
11097-69-1	Aroclor 1254	830,000 U
11096-82-5	Aroclor 1260	7,200,000
11104-28-2	Aroclor 1221	1,700,000 U
11141-16-5	Aroclor 1232	830,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

18 December 1996

Lee Hatcher
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RECEIVED
DEC 19 1996

 **DAMES & MOORE**
SEATTLE

RE: Client Project: 00681-089-163
ARI Job #R118

Dear Lee:

Please find enclosed the additional results for Sample MCCC-01 from the above referenced project.

As requested, this sample was re-analyzed following an additional 1:5,000 dilution and, from there, another 1:5 dilution for a net dilution factor of 1:25,000. These results are very similar to those that were obtained for the initial analysis. It does not appear that any transcription, entry, calculation, dilution or analytical errors were made during the first analysis.

A copy of this report will be kept on file at ARI. If you have any further questions, please call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.



Mark D. Harris
Project Manager
206-340-2866, ext. 113

Enclosures

cc: file #R118

MDH/mdh



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01
Dilution2
Lab Sample ID: R118F-DL2 QC Report No: R118-Dames & Moore
LIMS ID: 96-21713 Project:
Matrix: Concrete 00681-089-163
Date Sampled: 12/13/96
Date Received: 12/13/96
Data Release Authorized:
Reported: 12/18/96
Date extracted: 12/16/96 GPC Cleanup: No
Date analyzed: 12/17/96 Florisil Cleanup: No
Acid Cleanup: Yes
Sample Amount: 30.0 g-as-rec Sulfur Cleanup: No
Final Ext Vol: 10 mL Conc/Dilution Factor: 1:25000

CH
12/18/96

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	830,000 U
53469-21-9	Aroclor 1242	830,000 U
12672-29-6	Aroclor 1248	830,000 U
11097-69-1	Aroclor 1254	830,000 U
11096-82-5	Aroclor 1260	7,600,000
11104-28-2	Aroclor 1221	1,700,000 U
11141-16-5	Aroclor 1232	830,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-02

Lab Sample ID: R118G

QC Report No: R118-Dames & Moore

LIMS ID: 96-21714

Project:

Matrix: Concrete

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:

Reported: 12/17/96

Cathy M. Newme

Date extracted: 12/16/96

Date analyzed: 12/16/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Sample Amount: 28.4 g-as-rec

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	Aroclor 1254	35 U
11096-82-5	Aroclor 1260	8,100 E
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	87.5%
Tetrachlorometaxylene	72.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-02
DILUTION

Lab Sample ID: R118GDIL
LIMS ID: 96-21714
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project:

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:
Reported: 12/17/96

Date extracted: 12/16/96

Date analyzed: 12/16/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Sample Amount: 28.4 g-as-rec

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:50

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1,800 U
53469-21-9	Aroclor 1242	1,800 U
12672-29-6	Aroclor 1248	1,800 U
11097-69-1	Aroclor 1254	1,800 U
11096-82-5	Aroclor 1260	6,600
11104-28-2	Aroclor 1221	3,500 U
11141-16-5	Aroclor 1232	1,800 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D

Tetrachlorometaxylene D

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: R118
LIMS ID: 96-21713
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 12/17/96

Cathy M. Newman

LABORATORY CONTROL SAMPLE SPIKE RECOVERY

Date extracted: 12/16/96

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
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LABORATORY CONTROL SAMPLE

Aroclor 1242	245	333	73.5%
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Aroclor Surrogate Recoveries

Decachlorobiphenyl	82.5%
Tetrachlorometaxylene	83.5%

Values Reported in Total ug/kg as received



ANALYTICAL
RESOURCES
INCORPORATED

TRANSMITTAL

To: BRIAN CUSPER
DAMES & MOORE, INC.
500 MARKET PLACE TOWER
2025 FIRST AVENUE
SEATTLE, WA 98121

Date: 12/19/96

Submitted by: MDH

Reference: 00681-089-163

The following documents are enclosed:

for your review ☐

for your approval ☐

as you requested ☒

for your information ☐

Comments: _____

Sent via:

Total Pages: _____

First Class ☐

Express ☐

Courier ☒

FAX No.: _____



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01

Lab Sample ID: R118F

QC Report No: R118-Dames & Moore

LIMS ID: 96-21713

Project:

Matrix: Concrete

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:
Reported: 12/17/96

Cathy M. Newman

Date extracted: 12/16/96

GPC Cleanup: No

Date analyzed: 12/16/96

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 30.0 g-as-rec

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	880 Y
53469-21-9	Aroclor 1242	880 Y
12672-29-6	Aroclor 1248	S
11097-69-1	Aroclor 1254	S
11096-82-5	Aroclor 1260	S
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	880 Y

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl NR
Tetrachlorometaxylene 57.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

~~E: 4#~~ 5125

ANALYTICAL
RESOURCES
INCORPORATED

FRB 12/2A-03

EXTRACTION - PEST/PCB / SOIL

ARI Job No: R118

Client Name: D + M.

Client Project:

Acid
Crane

Date/Analyst:

Florisil Lot #

Date: _____

Concentration: 80.000000 ID: 539-4

Extraction Storage
Location:

Sample: AR1660 1.0 PPM Channel: ECD1A-DB5 1ul
Acquired: 16-DEC-96 8:53 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

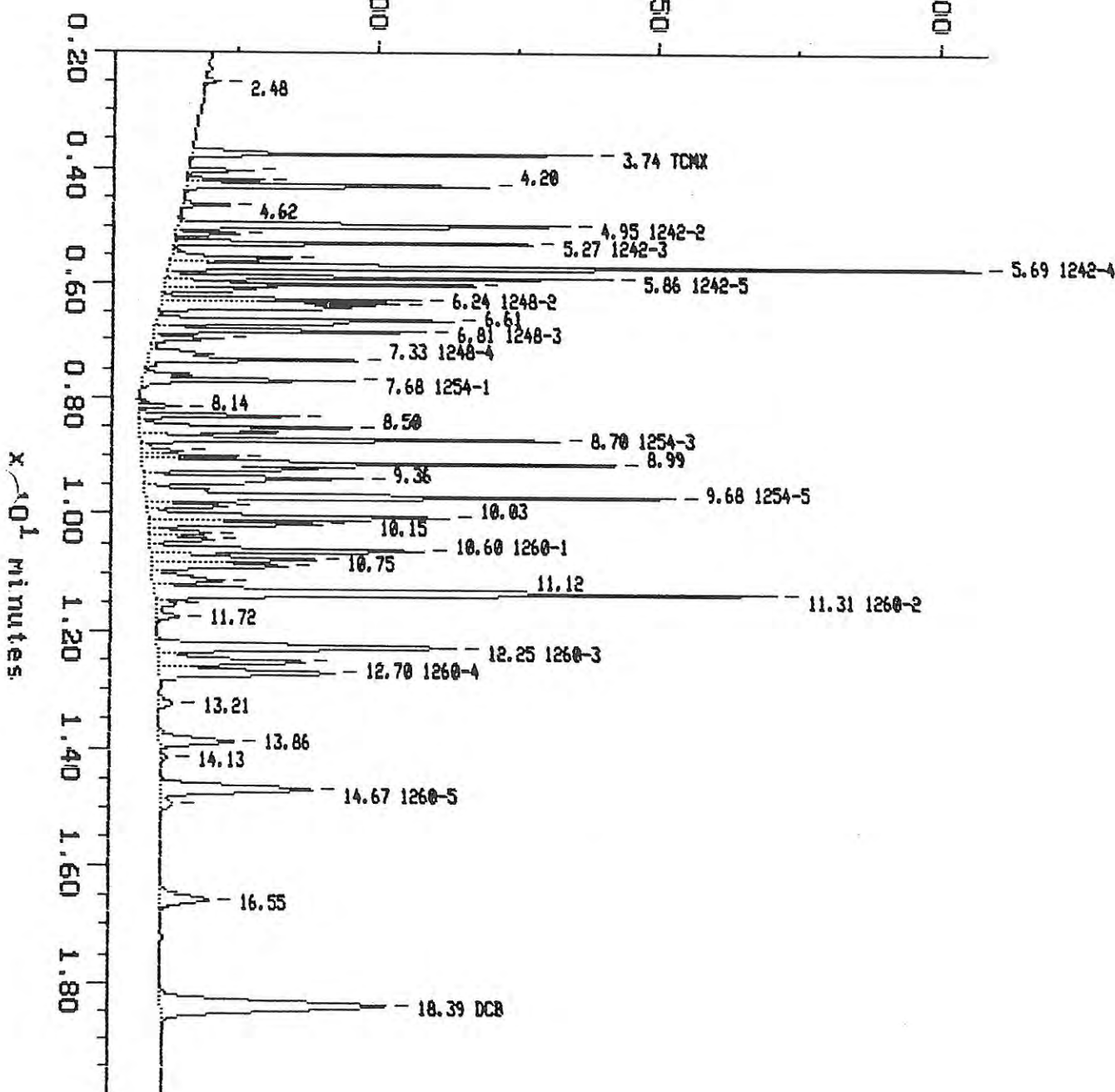
Filename: 121602
Operator: CH

$\times 10^{-1}$ volts

1.00

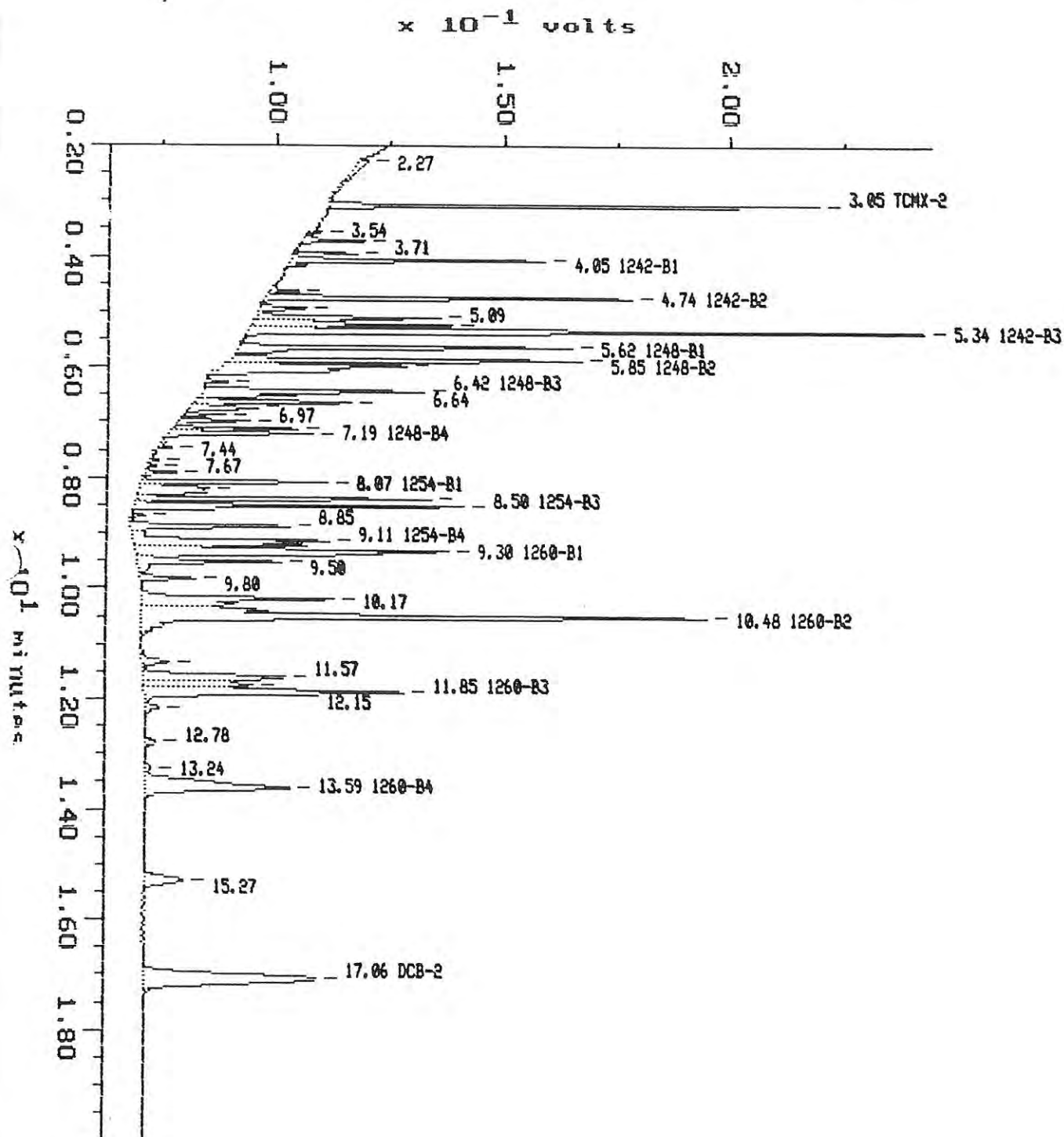
1.50

2.00



Sample: AR1660 1.0 PPM Channel: ECD1B-DB600 1ul
Acquired: 16-DEC-96 8:53 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121602
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 19-DEC-1996 8:48:36

SAMPLE: AR1660 1.0 PPM

#7 in Method: PCB ANALYSIS

Acquired: 16-DEC-1996 8:53

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121602

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.482	0.135	7835	2596			
3.743	0.204	219231	71520	HGHT	96.6219	TCMX
4.032	0.219	35287	11492			
4.195	0.228	40721	13940			
4.292	0.233	177051	54338	HGHT	0.9343	1242-1
4.618	0.251	25958	8408			
4.952	0.269	348870	70081	HGHT	0.9503	1242-2
5.122	0.279	39339	11359			
5.271	0.287	216819	64075	HGHT	0.9421	1242-3
5.530	0.301	119743	22102			
5.694	0.310	641317	144603	HGHT	0.9427	1242-4
5.864	0.319	272338	79534	HGHT	0.9350	1242-5
5.998	0.326	191318	55385	HGHT	0.9111	1248-1
6.087	0.331	54850	16273			
6.242	0.339	168738	46475	HGHT	0.9243	1248-2
6.324	0.344	272584	42970			
6.606	0.359	300527	53094			
6.813	0.370	203454	48598	HGHT	0.9227	1248-3
6.962	0.379	48640	12483			
7.325	0.398	211594	38016	HGHT	0.9266	1248-4
7.681	0.418	175242	38315	HGHT	0.8983	1254-1
8.141	0.443	26972	7522			
8.297	0.451	116827	28673	HGHT	0.8727	1254-2
8.497	0.462	235825	38195			
8.697	0.473	295895	74842	HGHT	0.8723	1254-3
8.898	0.484	31065	7008			
8.994	0.489	64346	17082			
9.105	0.495	466426	84735	HGHT	0.9257	1254-4
9.365	0.509	237498	39286			
9.676	0.526	521774	94661	HGHT	0.9283	1254-5
9.847	0.535	66220	14271			
10.032	0.546	268126	53637			
10.151	0.552	145331	31276			
10.314	0.561	57680	10818			

10.418	0.566	54104	11140			
10.603	0.577	255729	49025	HGHT	0.9140	1260-1
10.752	0.585	152904	29560			
10.870	0.591	134754	24446			
11.123	0.605	95522	12488			
11.308	0.615	676250	111056	HGHT	0.9237	1260-2
11.516	0.626	20598	3607			
11.723	0.637	23609	4007			
12.250	0.666	379003	53500	HGHT	0.9074	1260-3
12.509	0.680	185085	26384			
12.702	0.691	221524	31303	HGHT	0.8895	1260-4
13.207	0.718	15809	2322			
13.859	0.754	111156	12957			
14.126	0.768	7385	979			
14.668	0.798	235444	27341	HGHT	0.9045	1260-5
14.935	0.812	14002	1718			
16.552	0.900	86978	8710			
18.391	1.000	507711	40391	HGHT	181.1691	DCB
		-----	-----		-----	
TOTAL		9483009	1858594		295.2164	

GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
-----	-----	-----	-----	---	-----	-----
		1656396	412631	HGHT	0.9412	A-1242
		775104	188474	HGHT	0.9203	A-1248
		1576165	321225	HGHT	0.9057	A-1254
		1767950	272225	HGHT	0.9127	A-1260
		-----	-----		-----	
TOTAL		5775615	1194554		3.6799	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
-----	-----	-----	-----	---	-----	-----
2.267	0.133	38707	1982			
3.053	0.179	299858	108249	HGHT	94.5872	TCMX-2
3.543	0.208	5639	2443			
3.706	0.217	47345	14023			
3.951	0.232	41511	14124			
4.054	0.238	191669	56222	HGHT	0.9488	1242-B1
4.626	0.271	19244	6206			
4.737	0.278	293213	80608	HGHT	0.9463	1242-B2
4.922	0.289	42414	10175			
5.093	0.299	196876	40878			

5.226	0.306	178157	44350			
5.345	0.313	657349	149087	HGHT	0.9380	1242-B3
5.619	0.329	302423	73262	HGHT	0.9138	1248-B1
5.849	0.343	298229	77547	HGHT	0.9191	1248-B2
5.953	0.349	309481	40791			
6.257	0.367	15783	4882			
6.420	0.376	255307	49533	HGHT	0.9088	1248-B3
6.635	0.389	155577	34830			
6.732	0.395	56135	14861			
6.851	0.402	23176	8485			
6.969	0.409	49191	15187			
7.095	0.416	97160	27605			
7.192	0.422	100308	31740	HGHT	0.8851	1248-B4
7.436	0.436	15132	3282			
7.666	0.449	9097	1880			
7.785	0.456	5298	1683			
7.889	0.463	20724	6752			
8.067	0.473	151804	40986	HGHT	0.8788	1254-B1
8.186	0.480	120674	14990			
8.364	0.490	226355	64799	HGHT	0.9050	1254-B2
8.497	0.498	252046	72726	HGHT	0.9214	1254-B3
8.668	0.508	9444	3189			
8.846	0.519	127133	34287			
9.113	0.534	318481	42718	HGHT	0.8537	1254-B4
9.298	0.545	473222	68640	HGHT	0.8794	1260-B1
9.498	0.557	146543	31755			
9.802	0.575	51858	12184			
10.173	0.596	307158	42158			
10.485	0.615	838777	124318	HGHT	0.9624	1260-B2
11.308	0.663	33636	5607			
11.575	0.679	238251	30904			
11.723	0.687	123039	23540			
11.849	0.695	361397	56934	HGHT	0.9294	1260-B3
12.146	0.712	19272	2959			
12.776	0.749	17186	2462			
13.244	0.776	5312	962			
13.592	0.797	325341	31646	HGHT	0.9479	1260-B4
15.268	0.895	79322	8606			
17.056	1.000	446299	37731	HGHT	173.8194	DCB-2

D L

8405553

1674768

282.1446

GROUP SUMMARY: ECD18-DB608 1u1

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1444654	359180	HGHT	0.9350	A-1242-2
		661844	158819	HGHT	0.9089	A-1248-2
		948687	221229	HGHT	0.8954	A-1254-2

TOTAL

1998738

281538

HGHT

0.9328

A-1260-2

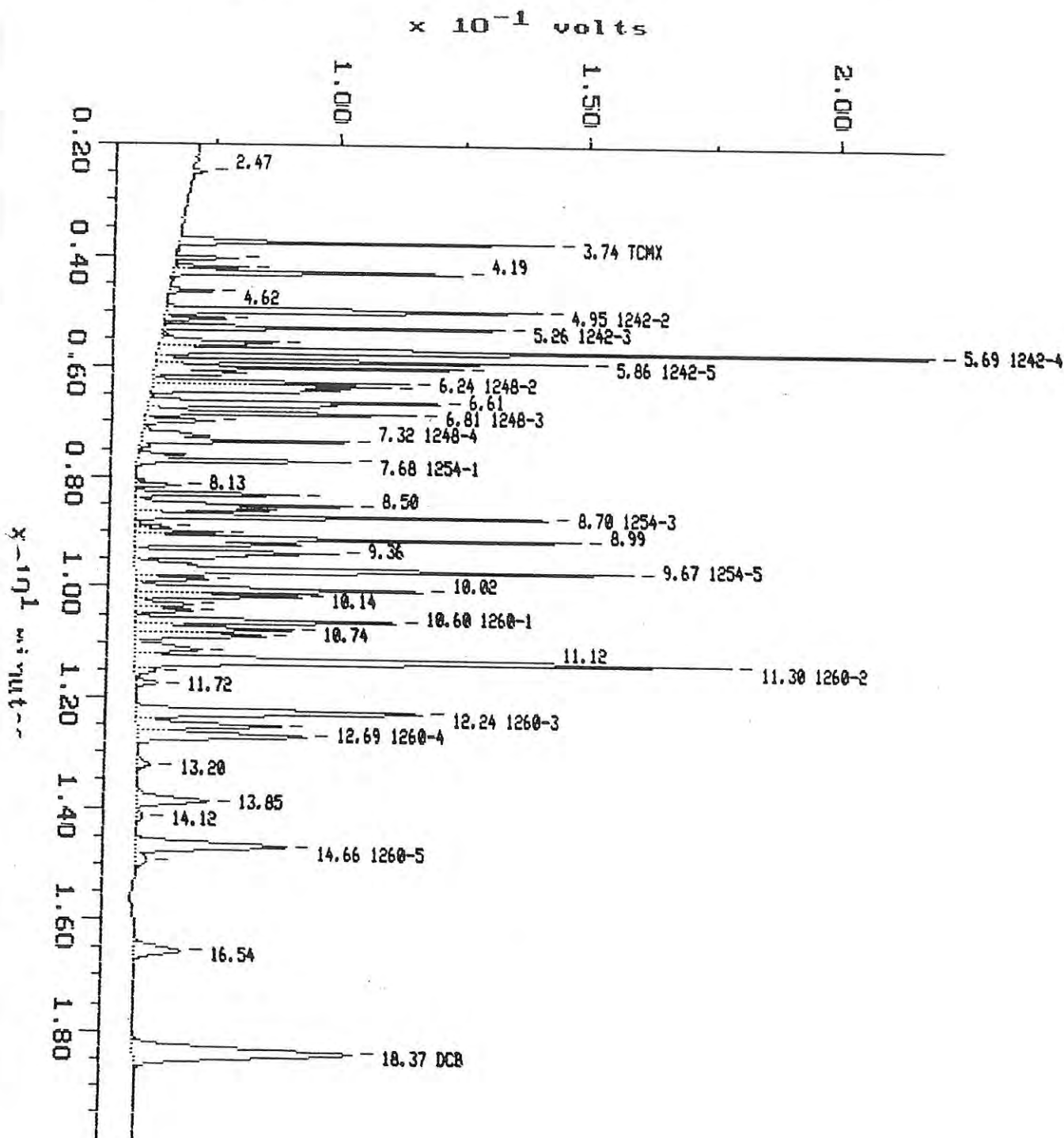
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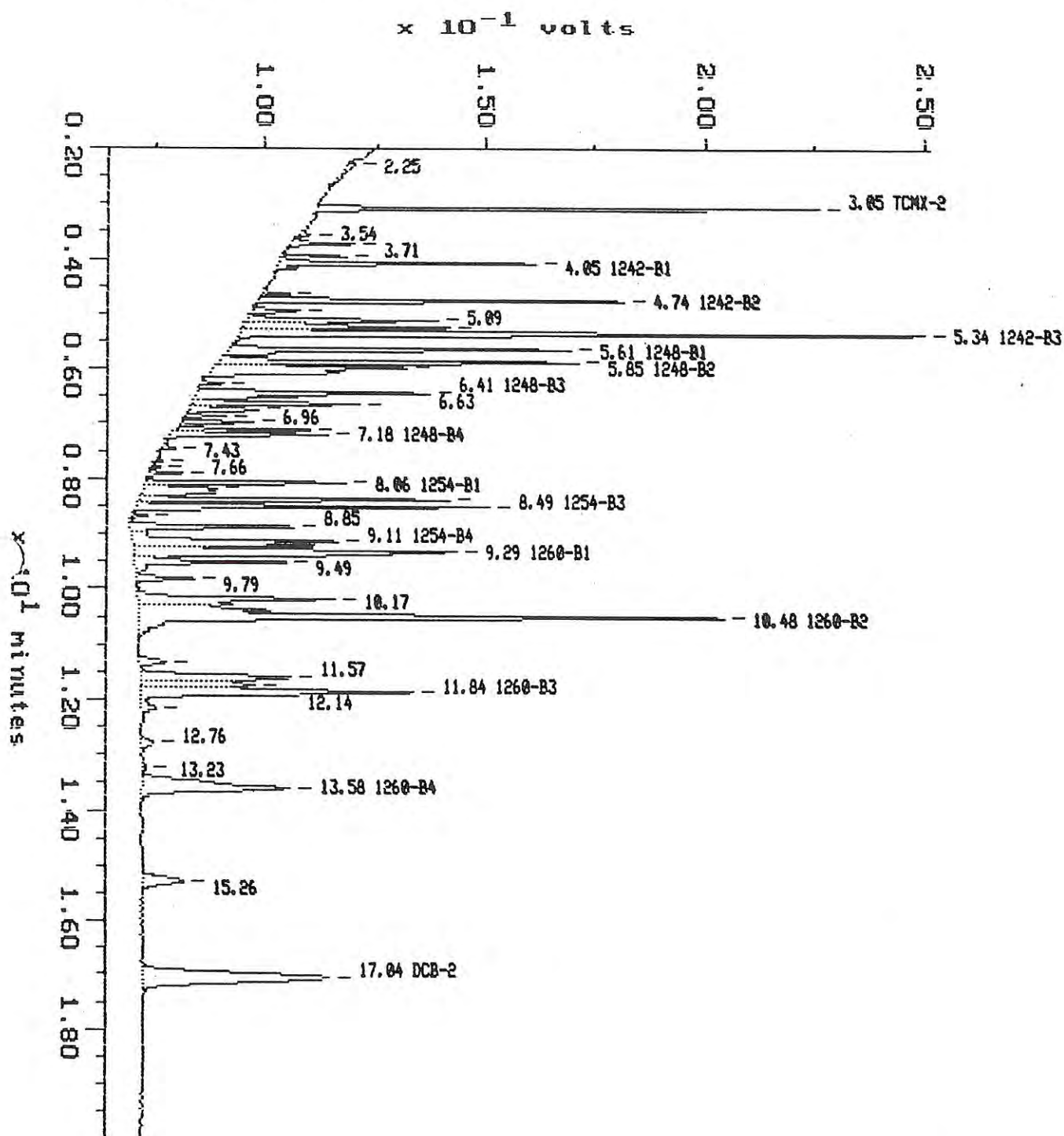
Sample: AR1660 1.0 PPM Channel: ECD1A-DB5 1u1
Acquired: 16-DEC-96 16:47 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121617
Operator: CH



Sample: AR1660 1.0 PPM Channel: ECD1B-DB600 1u1
Acquired: 16-DEC-96 16:47 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121617
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 19-DEC-1996 8:48:59

SAMPLE: AR1660 1.0 PPM

#22 in Method: PCB ANALYSIS

Acquired: 16-DEC-1996 16:47

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121617

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.475	0.135	7865	2522			
3.736	0.203	231856	74720	HGHT	101.1499	TCMX
4.032	0.220	38012	12155			
4.188	0.228	43611	14447			
4.284	0.233	186152	57331	HGHT	0.9986	1242-1
4.618	0.251	27645	8917			
4.952	0.270	368130	74731	HGHT	1.0289	1242-2
5.122	0.279	42016	12257			
5.263	0.287	230224	67682	HGHT	1.0053	1242-3
5.530	0.301	131703	23764			
5.686	0.310	689489	154724	HGHT	1.0212	1242-4
5.864	0.319	297719	85660	HGHT	1.0202	1242-5
5.990	0.326	270681	61106	HGHT	1.0162	1248-1
6.242	0.340	179506	51101	HGHT	1.0332	1248-2
6.324	0.344	304478	47378			
6.606	0.360	331753	57750			
6.813	0.371	225402	53380	HGHT	1.0237	1248-3
6.962	0.379	54172	13677			
7.318	0.398	232044	41303	HGHT	1.0167	1248-4
7.681	0.418	190037	42592	HGHT	1.0153	1254-1
8.134	0.443	33952	8953			
8.297	0.452	132330	32354	HGHT	0.9992	1254-2
8.497	0.463	269373	43071			
8.697	0.473	318827	82153	HGHT	0.9741	1254-3
8.898	0.484	25273	6688			
8.994	0.490	62850	17183			
9.105	0.496	482542	88901	HGHT	0.9782	1254-4
9.357	0.509	238268	40650			
9.669	0.526	537699	99023	HGHT	0.9761	1254-5
9.847	0.536	65827	14596			
10.025	0.546	277535	56832			
10.144	0.552	151338	32998			
10.307	0.561	56647	11147			
10.411	0.567	53659	11291			

10.596	0.577	266639	51873	HGHT	0.9724	1260-1
10.744	0.585	160327	31357			
10.863	0.591	142293	25610			
11.115	0.605	99432	13171			
11.301	0.615	719375	118480	HGHT	0.9923	1260-2
11.508	0.627	20957	3971			
11.714	0.638	25856	4389			
12.242	0.666	407026	56942	HGHT	0.9702	1260-3
12.502	0.681	201618	28801			
12.695	0.691	240095	33738	HGHT	0.9645	1260-4
13.199	0.719	17788	2591			
13.852	0.754	121363	14073			
14.119	0.769	8184	1081			
14.660	0.798	255433	29741	HGHT	0.9896	1260-5
14.912	0.812	16811	1998			
16.537	0.900	94845	9163			
18.369	1.000	540979	43384	HGHT	196.3926	DCB

TOTAL		10127636	1973401		316.5384	
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1771715	440128	HGHT	1.0168	A-1242
		907633	206890	HGHT	1.0222	A-1248
		1661435	345023	HGHT	0.9830	A-1254
		1888568	290774	HGHT	0.9808	A-1260
TOTAL		6229351	1282815		4.0027	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.252	0.132	27190	1340			
3.053	0.179	316169	114366	HGHT	100.7444	TCMX-2
3.543	0.208	6769	2612			
3.706	0.217	48331	14470			
3.951	0.232	43316	14610			
4.054	0.238	201176	58204	HGHT	0.9985	1242-B1
4.626	0.271	15988	5992			
4.737	0.278	302646	83279	HGHT	0.9912	1242-B2
4.915	0.288	45862	10947			
5.093	0.299	207483	43190			
5.226	0.307	187142	46983			

5.338	0.313	686573	155508	HGHT	0.9878	1242-B3
5.612	0.329	325701	77130	HGHT	0.9731	1248-B1
5.849	0.343	325601	82031	HGHT	0.9811	1248-B2
5.953	0.349	331082	43874			
6.250	0.367	17763	5454			
6.413	0.376	276853	52906	HGHT	0.9788	1248-B3
6.628	0.389	167028	37843			
6.724	0.395	63559	16097			
6.851	0.402	25894	9213			
6.962	0.409	55193	16721			
7.095	0.416	105918	30550			
7.184	0.422	121965	35357	HGHT	1.0009	1248-B4
7.429	0.436	12307	3046			
7.659	0.449	4652	1775			
7.778	0.456	6317	1972			
7.889	0.463	24162	7714			
8.059	0.473	170782	45682	HGHT	0.9916	1254-B1
8.178	0.480	138904	17401			
8.364	0.491	254242	70468	HGHT	0.9942	1254-B2
8.490	0.498	277586	80769	HGHT	1.0353	1254-B3
8.660	0.508	10365	3473			
8.846	0.519	143527	37135			
9.113	0.535	356959	46540	HGHT	0.9425	1254-B4
9.291	0.545	506589	73355	HGHT	0.9459	1260-B1
9.491	0.557	158733	34417			
9.795	0.575	58005	13035			
10.166	0.597	329771	44834			
10.485	0.615	906322	133220	HGHT	1.0384	1260-B2
11.301	0.663	36977	6199			
11.575	0.679	266608	33786			
11.723	0.688	125525	25907			
11.842	0.695	395512	61559	HGHT	1.0125	1260-B3
12.139	0.712	22531	3231			
12.762	0.749	18477	2729			
13.229	0.776	7632	1093			
13.585	0.797	352935	33563	HGHT	1.0100	1260-B4
15.261	0.896	86769	9495			
17.041	1.000	486062	41968	HGHT	196.0988	DCB-2

ITAL

9063452

1793122

311.7248

GROUP SUMMARY: ECD18-DB608 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1516096	374202	HGHT	0.9856	A-1242-2
		724418	170294	HGHT	0.9845	A-1248-2
		1059569	243458	HGHT	0.9970	A-1254-2
		2161359	301696	HGHT	1.0062	A-1260-2

TOTAL

5461442

1089650

3.9733



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: R118MB
LIMS ID: 96-21713
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project:
00681-089-163

Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/17/96

Carl M. Newman

Date extracted: 12/16/96
Date analyzed: 12/16/96

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1

Sample Amount: 30.0 g-as-rec
Final Ext Vol: 10 mL

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

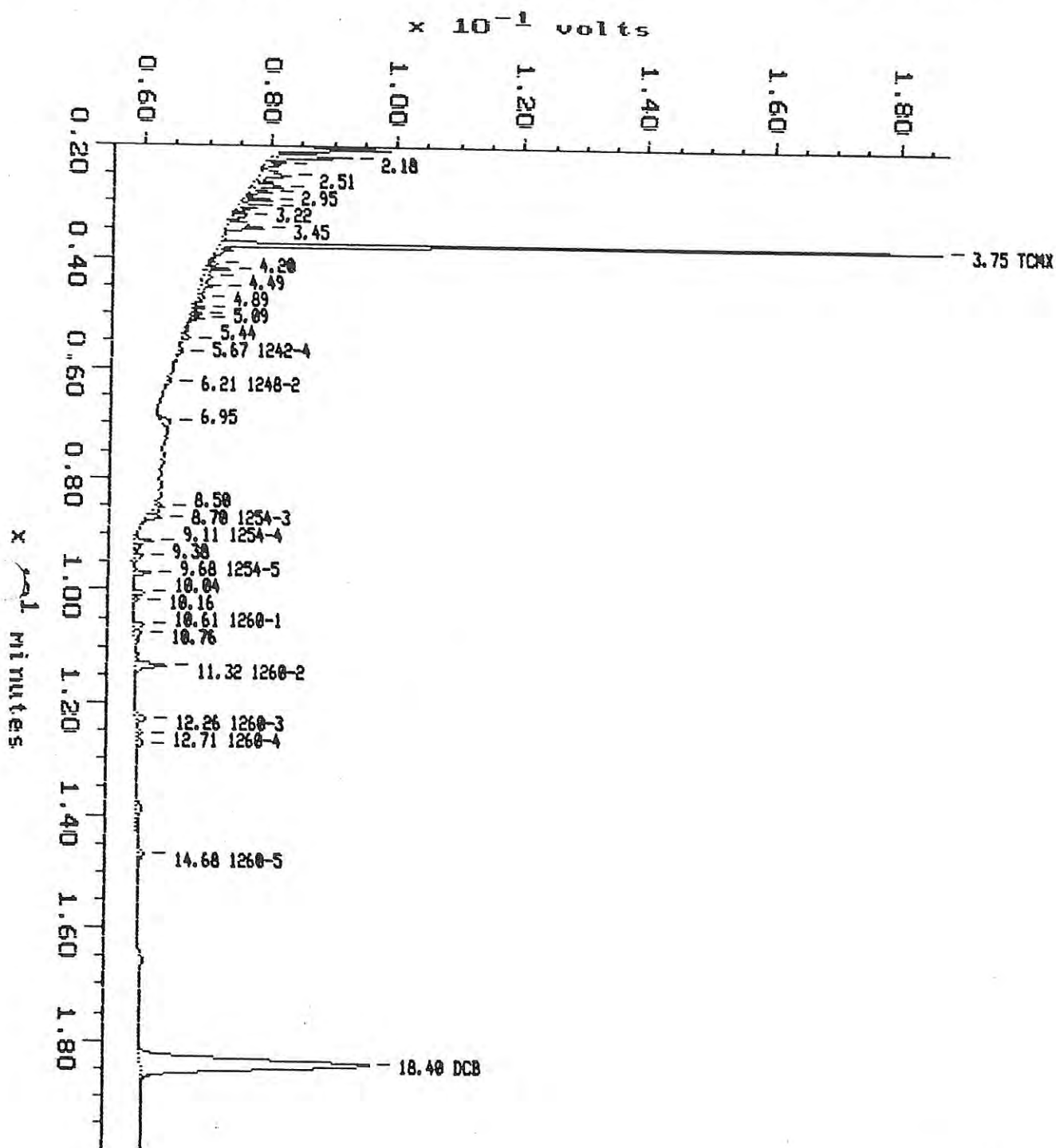
Decachlorobiphenyl 80.0%
Tetrachlorometaxylene 79.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Sample: R118 MBS 12/16 Channel: ECD1A-DB5 1u1
Acquired: 16-DEC-96 12:03 Method: C:\MAX\PCBADEC16
Inj Vol: 1.00

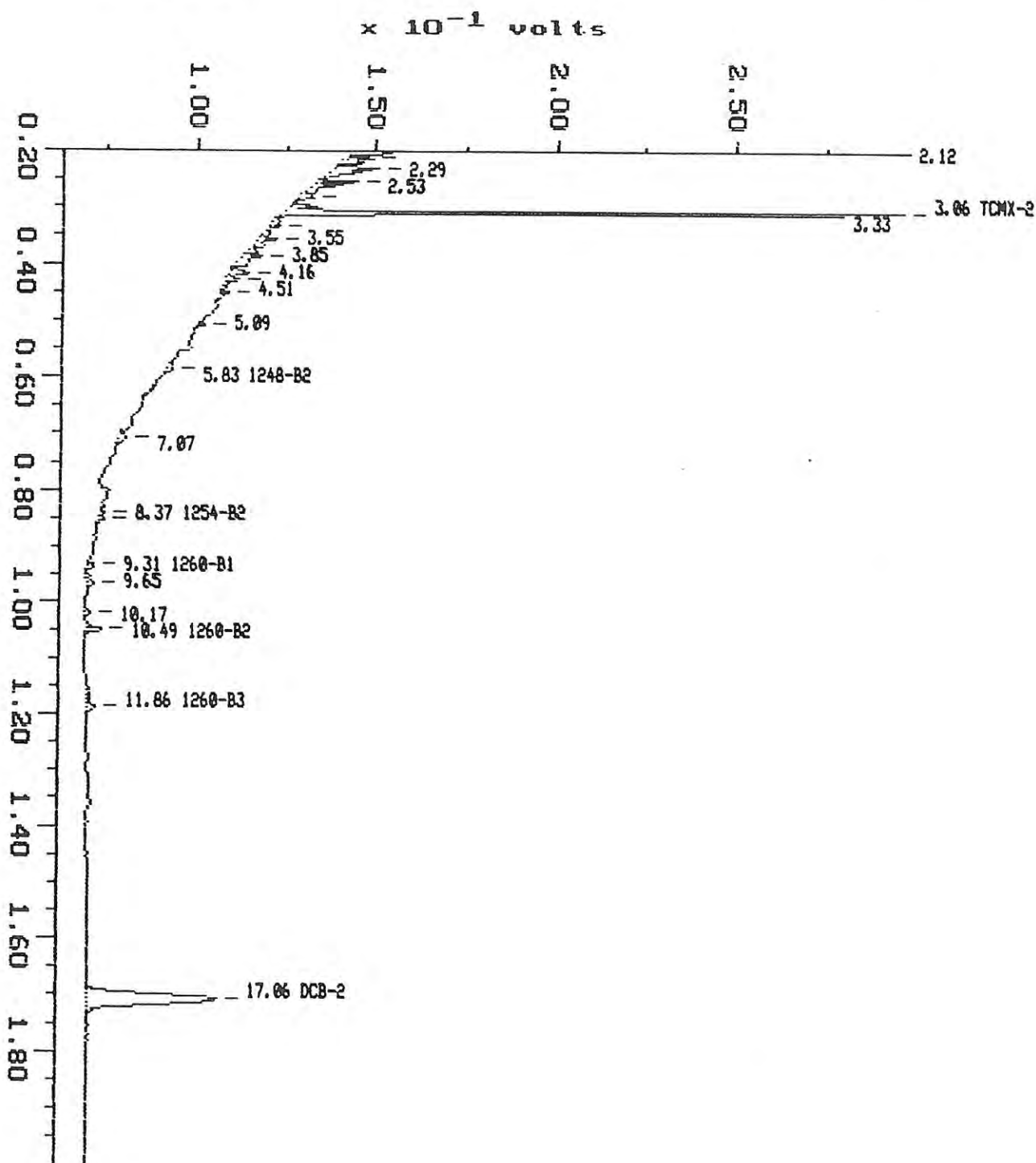
Filename: 121608
Operator: CH



Sample: R118 MBS 12/16
Acquired: 16-DEC-96 12:03
Inj Vol: 1.00

Channel: ECD1B-DB600 1ul
Method: C:\MAX\PCB\DEC16

Filename: 121608
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 16-DEC-1996 14:06:30

SAMPLE: R118 MBS 12/16

#13 in Method: PCB ANALYSIS

Acquired: 16-DEC-1996 12:03

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121608

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.178	0.118	44665	12339			
2.289	0.124	13622	3253			
2.512	0.137	36538	4873			
2.719	0.148	21828	4974			
2.808	0.153	10986	3664			
2.949	0.160	13651	4636			
3.053	0.166	18780	5215			
3.224	0.175	13261	2388			
3.446	0.187	32539	5832			
3.750	0.204	341969	115016	HGHT	158.1523	TCMX
4.106	0.223	5105	1469			
4.203	0.228	12715	3666			
4.336	0.236	7235	1313	HGHT	Invalid	1242-1
4.492	0.244	15237	2805			
4.700	0.255	7894	1085			
4.885	0.266	5153	1647			
4.996	0.272	6707	1733	HGHT	Invalid	1242-2
5.085	0.276	12864	2075			
5.441	0.296	4203	1185			
5.671	0.308	3282	579	HGHT	Invalid	1242-4
6.205	0.337	2910	695	HGHT	Invalid	1248-2
6.954	0.378	8466	1446			
8.504	0.462	15397	1516			
8.705	0.473	10736	2418	HGHT	Invalid	1254-3
9.113	0.495	12319	2590	HGHT	Invalid	1254-4
9.380	0.510	6805	1293			
9.684	0.526	10794	2542	HGHT	0.0038	1254-5
10.040	0.546	7073	1709			
10.158	0.552	3090	802			
10.611	0.577	7306	1543	HGHT	0.0119	1260-1
10.759	0.585	8194	929			
11.323	0.615	29938	4736	HGHT	0.0189	1260-2
12.257	0.666	10745	1589	HGHT	0.0199	1260-3
12.517	0.680	4754	769			

12.710	0.691	5676	923	HGHT	0.0252	1260-4
14.675	0.798	14326	722	HGHT	0.0254	1260-5
18.398	1.000	457701	36141	HGHT	159.9290	DCB
TOTAL		1244468	242111		318.1863	

GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		17224	3625	HGHT	0.0000	A-1242
		2910	695	HGHT	0.0000	A-1248
		33850	7550	HGHT	0.0000	A-1254
		67992	9514	HGHT	0.0192	A-1260
TOTAL		121976	21384		0.0192	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.119	0.124	41008	8011			
2.289	0.134	92464	12883			
2.527	0.148	70648	11974			
2.808	0.165	18201	4313			
3.061	0.179	524960	172542	HGHT	163.3317	TCMX-2
3.328	0.195	36868	3498			
3.550	0.208	56362	5773			
3.854	0.226	45624	5640			
4.158	0.244	30133	5379			
4.277	0.251	17176	3495			
4.514	0.265	9201	2096			
5.085	0.298	6093	2080			
5.827	0.342	17293	1586	HGHT	Invalid	1248-B2
7.066	0.414	10576	1617			
8.371	0.491	4903	1225	HGHT	0.0073	1254-B2
8.497	0.498	6218	1851	HGHT	0.0068	1254-B3
9.305	0.546	11492	1668	HGHT	Invalid	1260-B1
9.647	0.566	13107	1750			
10.173	0.596	3817	1001			
10.492	0.615	19893	4245	HGHT	0.0113	1260-B2
11.864	0.696	25332	1834	HGHT	0.0208	1260-B3
17.056	1.000	409892	35129	HGHT	160.3762	DCB-2
TOTAL		1471259	289670		323.7540	

GROUP SUMMARY: ECD1B-DB608 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242-2
		17293	1586	HGHT	0.0000	A-1248-2
		11121	3075	HGHT	0.0000	A-1254-2
		56716	7747	HGHT	0.0070	A-1260-2
		85131	12409		0.0070	

TC 1



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: R118
LIMS ID: 96-21713
Matrix: Concrete

QC Report No: R118-Dames & Moore
Project: 00681-089-163

Data Release Authorized:
Reported: 12/17/96

Cathy M. Newman

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 12/16/96

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
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LABORATORY CONTROL SAMPLE

Aroclor 1242	245	333	73.5%
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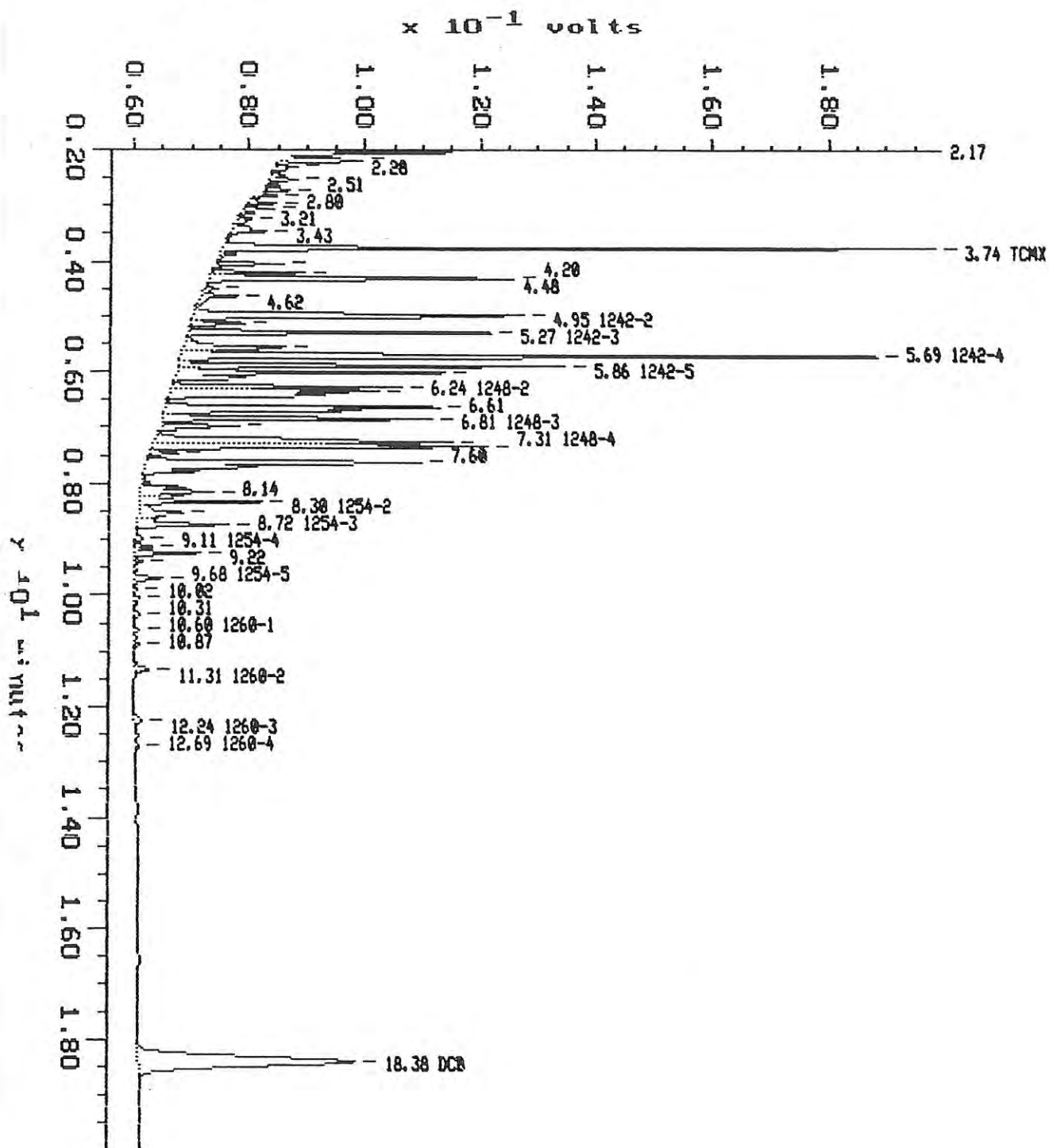
Aroclor Surrogate Recoveries

Decachlorobiphenyl	82.5%
Tetrachlorometaxylene	83.5%

Values Reported in Total ug/kg as received

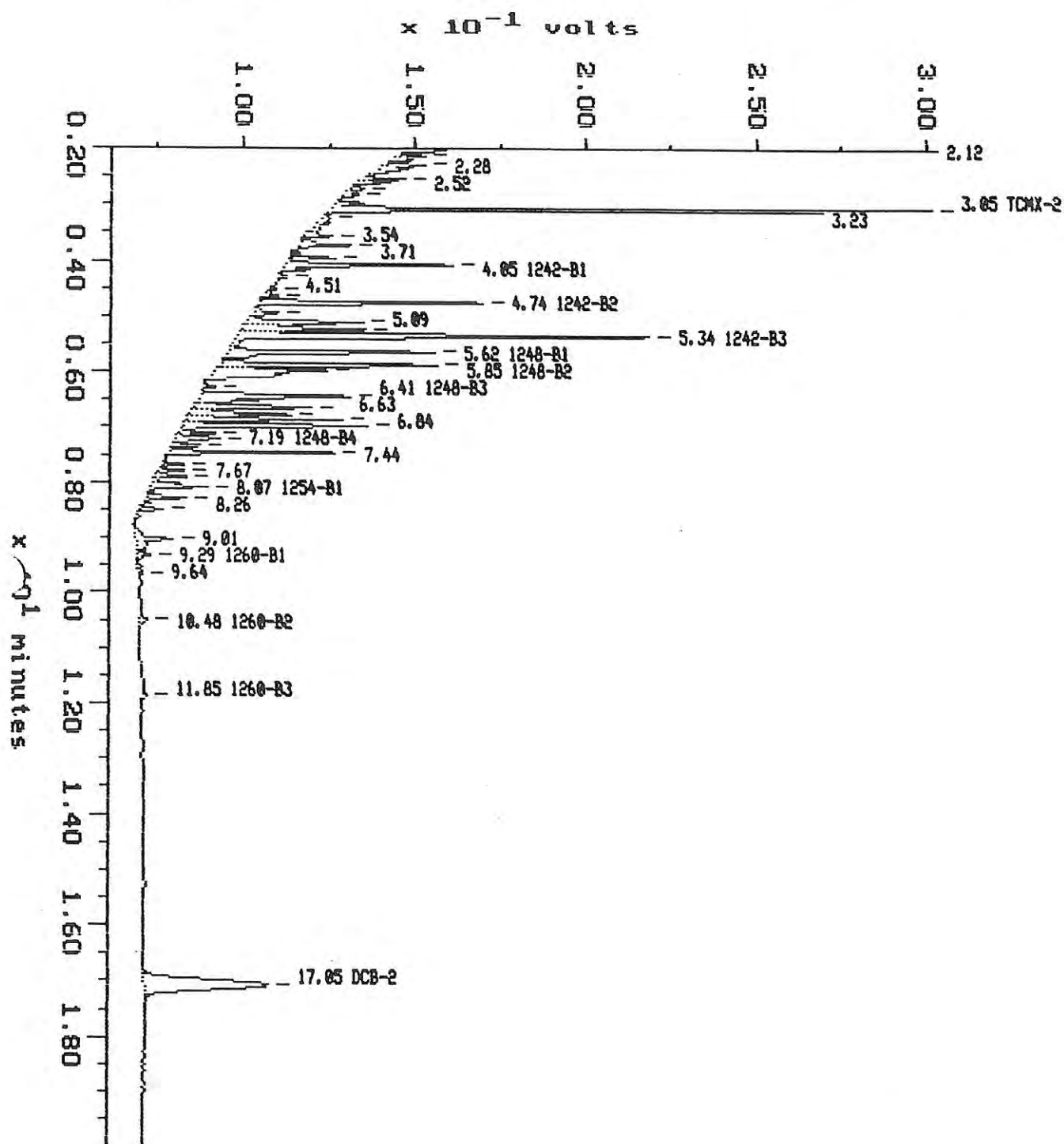
Sample: R118 SRS 12/16 Channel: ECD1A-DB5 1u1
Acquired: 16-DEC-96 12:32 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121609
Operator: CH



Sample: R118 SBS 12/16 Channel: ECD1B-DB608 1ul
Acquired: 16-DEC-96 12:32 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121609
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 16-DEC-1996 14:06:52

SAMPLE: R118 SBS 12/16

#14 in Method: PCB ANALYSIS

Acquired: 16-DEC-1996 12:32

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121609

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DBS 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.171	0.118	49193	13468			
2.282	0.124	15310	3740			
2.512	0.137	29909	4993			
2.712	0.148	15286	4193			
2.801	0.152	8636	3266			
2.942	0.160	14589	5035			
3.038	0.165	19518	5458			
3.209	0.175	13133	2482			
3.431	0.187	32476	6250			
3.743	0.204	380119	123296	HGHT	169.8641	TCMX 147
4.032	0.219	38495	12003			
4.195	0.228	46899	16021			
4.284	0.233	172794	52388	HGHT	0.8930	1242-1
4.485	0.244	9222	2486			
4.618	0.251	27835	6558			
4.952	0.269	292943	57282	HGHT	0.7432	1242-2
5.122	0.279	35193	9428			
5.271	0.287	176597	52254	HGHT	0.7418	1242-3
5.538	0.301	96199	17590			
5.694	0.310	531972	119935	HGHT	0.7574	1242-4
5.864	0.319	225415	66556	HGHT	0.7600	1242-5
5.990	0.326	195836	46463	HGHT	0.7509	1248-1
6.242	0.340	139341	39538	HGHT	0.7661	1248-2
6.324	0.344	214870	35815			
6.606	0.359	276197	47173			
6.813	0.371	185158	46459	HGHT	0.8780	1248-3
6.962	0.379	50568	13558			
7.236	0.394	267066	51660			
7.310	0.398	206709	57837	HGHT	1.4864	1248-4
7.436	0.405	19185	4892			
7.600	0.414	276377	47252			
8.141	0.443	98575	12620			
8.304	0.452	75014	21248	HGHT	0.6261	1254-2
8.512	0.463	48196	7896			

0.7791

0.7791

0.7348

8.720	0.475	71490	15692	HGHT	0.1298	1254-3
8.942	0.487	7357	1186			
9.105	0.495	10704	3121	HGHT	Invalid	1254-4
9.224	0.502	44591	11323			
9.365	0.510	4603	1196			
9.676	0.527	20776	4639	HGHT	0.0230	1254-5
9.854	0.536	1867	467			
10.025	0.546	6382	1050			
10.314	0.561	5244	1102			
10.596	0.577	3493	799	HGHT	Invalid	1260-1
10.870	0.592	2896	727			
11.308	0.615	14122	2445	HGHT	0.0010	1260-2
12.242	0.666	6024	958	HGHT	0.0097	1260-3
12.695	0.691	4764	468	HGHT	0.0132	1260-4
18.376	1.000	468920	37434	HGHT	166.3466	DCB 165

TOTAL		4958138	1099700		344.7906	
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1399720	348414	HGHT	0.7702	A-1242
		727044	190298	HGHT	0.9303	A-1248
		178064	44700	HGHT	0.0893	A-1254
		28403	4670	HGHT	0.0039	A-1260
TOTAL		2333232	588082		1.7939	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.119	0.124	40819	7969			
2.282	0.134	88478	12023			
2.519	0.148	57314	12348			
2.705	0.159	17615	4350			
2.801	0.164	20026	4510			
3.053	0.179	527988	175599	HGHT	166.8226	TCMX-2
3.231	0.190	36855	2261			
3.543	0.208	24800	7899			
3.706	0.217	61061	15282			
3.951	0.232	37041	13445			
4.054	0.238	179039	48738	HGHT	0.7777	1242-B1
4.270	0.250	10447	2656			
4.507	0.264	10202	2391			

0.7348

124L

4.618	0.271	13836	4376			
4.737	0.278	236527	65264	HGHT	0.7054	1242-B2
4.915	0.288	35915	7565			
5.093	0.299	164353	34187			
5.226	0.307	143042	36155			
5.338	0.313	530509	120060	HGHT	0.7213	1242-B3
5.619	0.330	250681	59810	HGHT	0.7145	1248-B1
5.849	0.343	243885	62884	HGHT	0.7219	1248-B2
5.953	0.349	238197	32884			
6.250	0.367	10057	3411			
6.413	0.376	237859	44204	HGHT	0.8002	1248-B3
6.628	0.389	156325	35012			
6.754	0.396	123301	30180			
6.843	0.401	152053	45404			
6.962	0.408	189872	54161			
7.095	0.416	36554	10442			
7.192	0.422	53660	12785	HGHT	0.3171	1248-B4
7.318	0.429	23510	7696			
7.436	0.436	156524	48007			
7.666	0.450	18826	6290			
7.785	0.457	25840	7140			
7.889	0.463	28581	9164			
8.074	0.474	80678	16232	HGHT	0.3266	1254-B1
8.260	0.484	43903	11974			
8.482	0.498	23191	6586	HGHT	0.0629	1254-B3
9.009	0.528	76024	10724			
9.291	0.545	20495	3749	HGHT	0.0196	1260-B1
9.639	0.565	7571	846			
10.485	0.615	13383	2301	HGHT	Invalid	1260-B2
11.849	0.695	5181	1003	HGHT	0.0082	1260-B3
17.048	1.000	416666	36039	HGHT	165.0580	DCB-2

TOTAL

4869483

1136005

337.0559

GROUP SUMMARY: ECD1B-DB608 1ul

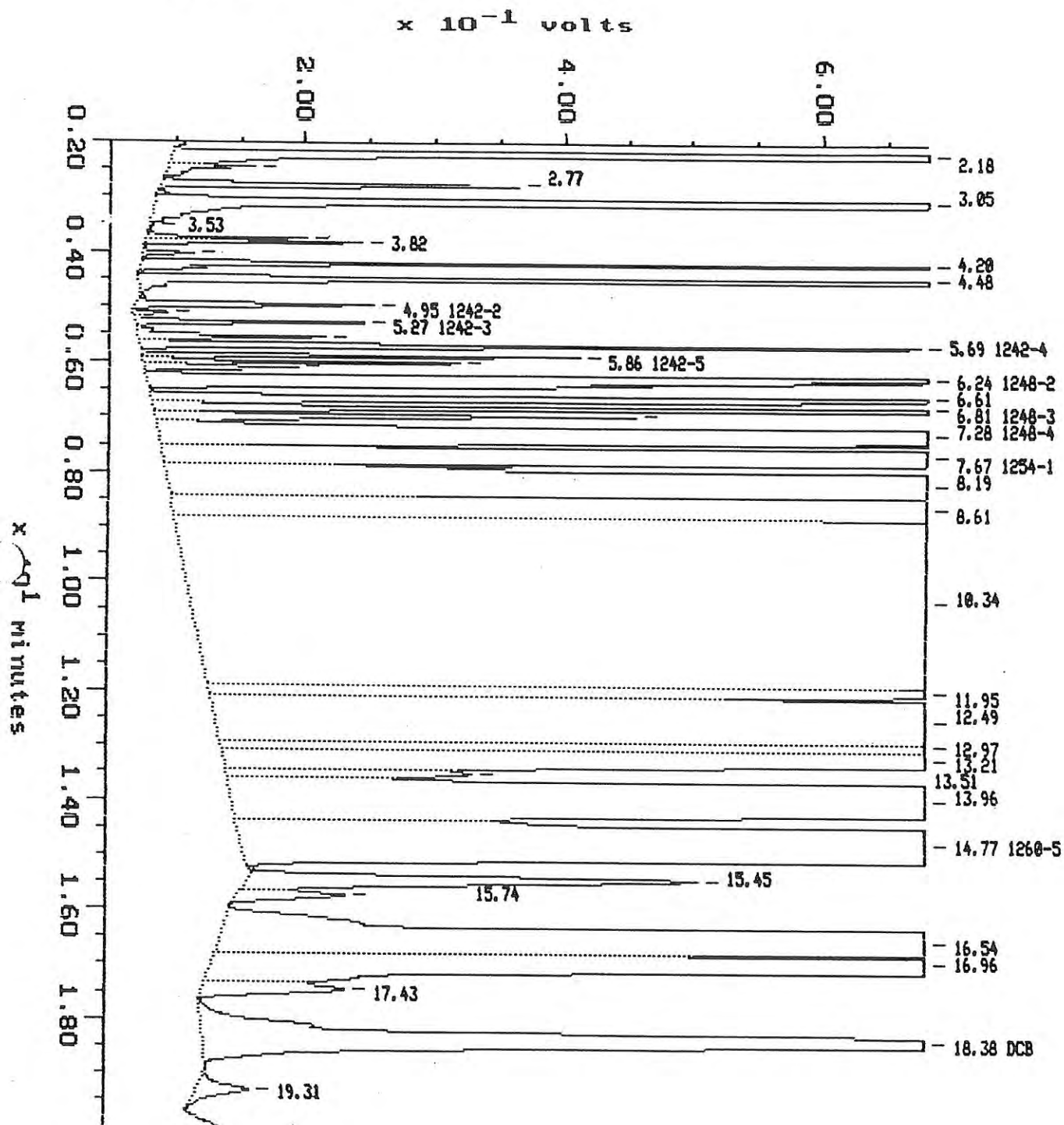
Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1196755	293872	HGHT	0.7247	A-1242-2
		535403	119872	HGHT	0.6607	A-1248-2
		103869	22818	HGHT	0.0676	A-1254-2
		39059	7054	HGHT	0.0048	A-1260-2
		1875087	443616		1.4577	

0.1L

Sample: R118 F
Acquired: 16-DEC-96 13:01
Inj Vol: 1.00

Channel: ECD1A-DB5 1u1
Method: C:\MAX\PCB\DEC16

Filename: 121610
Operator: CH

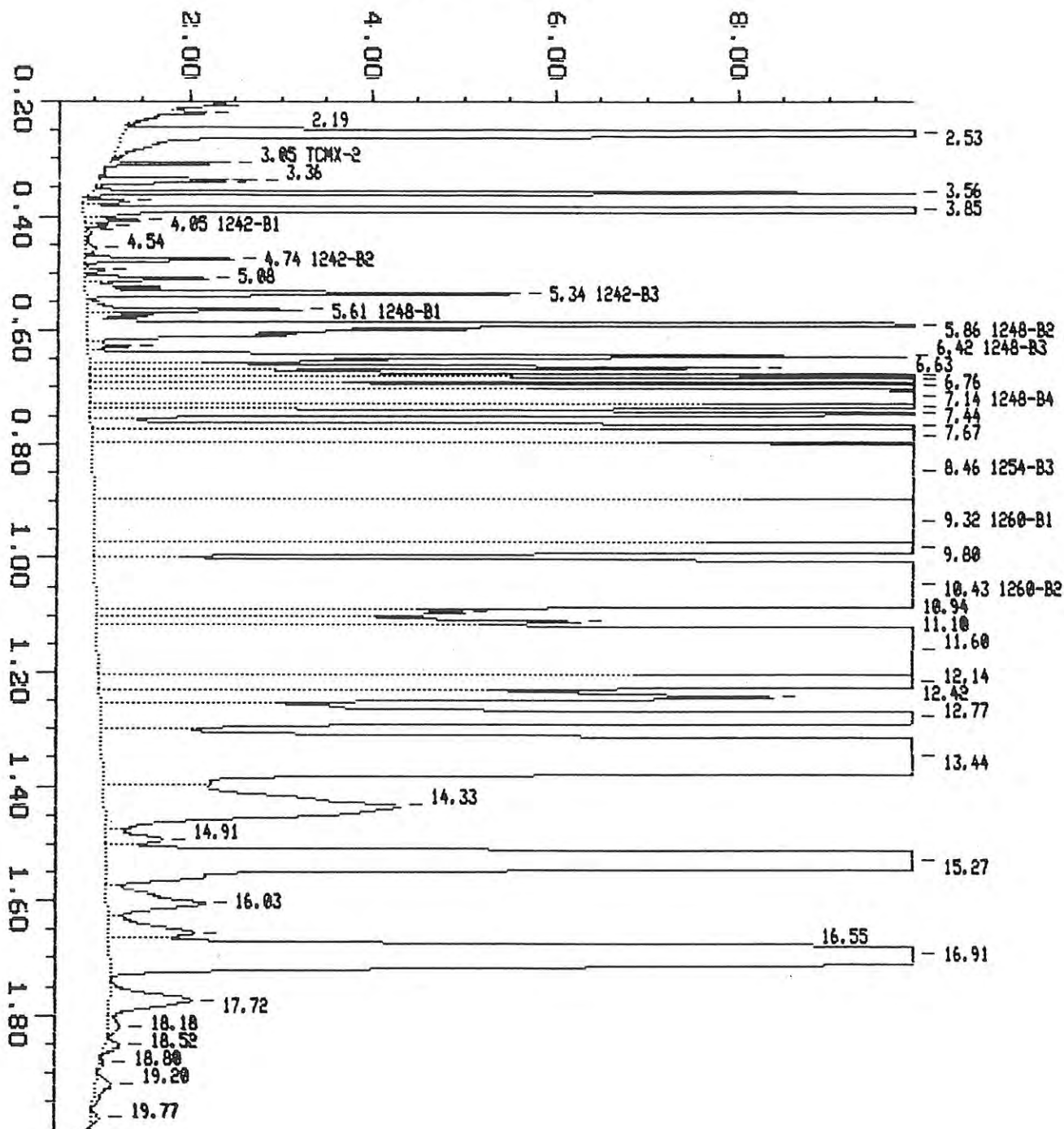


Sample: R118 F
Acquired: 16-DEC-96 13:01
Inj Vol: 1.00

Channel: ECD1B-DB600 1u1
Method: C:\MAX\PCB\DEC16

Filename: 121610
Operator: CH

$\times 10^{-1}$ volts



MAXIMA 820 CUSTOM REPORT

Printed: 16-DEC-1996 14:07:18

SAMPLE: R118 F

#15 in Method: PCB ANALYSIS
Acquired: 16-DEC-1996 13:01
Rate: 2.2 points/sec
Duration: 20.000 minutes
Operator: CH

Type: UNKN
Instrument: ECD1
Filename: 121610
Index: Disk
Injection Volume: 1.0

DETECTOR: ECD1A-DBS 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.178	0.119	16813656	1903225			
2.445	0.133	346772	67709			
2.771	0.151	1043186	276017			
3.046	0.166	17459741	1914982			
3.528	0.192	9919	2493			
3.743	0.204	352369	123194	HGHT	169.7202	TCMX 114
3.817	0.208	547695	166096			
4.025	0.219	124067	37916			
4.195	0.228	13147038	1925377			
4.477	0.244	15694278	1927767			
4.952	0.269	866332	183349	HGHT	3.3667	1242-2
5.122	0.279	109453	26020			
5.271	0.287	649525	175395	HGHT	3.3502	1242-3
5.530	0.301	625271	144420			
5.686	0.309	2646409	600903	HGHT	5.8901	1242-4
5.864	0.319	1124694	337552	HGHT	6.0190	1242-5
5.990	0.326	820119	243340	HGHT	5.3597	1248-1
6.007	0.331	394102	118776			
6.242	0.340	18445242	1921221	HGHT	169.4289	1248-2
6.606	0.359	15374474	1918034			
6.806	0.370	14225098	1916278	HGHT	143.7264	1248-3
6.962	0.379	1649507	372431			
7.281	0.396	116688364	1912116	HGHT	164.3507	1248-4
7.674	0.418	116446220	1908669	HGHT	185.5508	1254-1
8.193	0.446	125184494	1904117			
8.608	0.468	121128813	1900475			
10.336	0.562	1161703238	1885323			
11.946	0.650	18415733	1871210			
12.487	0.680	142296910	1866463			
12.969	0.706	17702106	1862236			
13.207	0.719	116606677	1860155			
13.511	0.735	1422833	189030			
13.963	0.760	132995291	1853521			
14.772	0.804	134057747	1846433	HGHT	186.3313	1260-5

15.446	0.841	3647721	349371		
15.736	0.856	781295	84430		
16.544	0.900	124819266	1863910		
16.959	0.923	117074152	1869301		
17.434	0.949	1214182	109899		
18.376	1.000	114483659	1875206	HGHT	112888.4209
19.311	1.051	565772	39713		

DCB NR

TOTAL		18941223	3648054		193.7059
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		5286960	1297200	HGHT	4.0981	A-1242
		1820119	1243340	HGHT	Invalid	A-1248
		10	10	HGHT	Invalid	A-1254
		10	10	HGHT	Invalid	A-1260
		16107079	11540539		4.0981	

2.63347

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.185	0.716	120145	42180			
2.534	0.830	18031779	1870154			
3.053	1.000	332165	127265	HGHT	113.9934	TCMX-2
3.357	1.100	731914	169149			
3.565	1.168	12924190	1903514			
3.721	1.219	191646	46511			
3.854	1.262	15782137	1911393			
4.054	1.328	212746	57157	HGHT	0.9712	1242-B1
4.151	1.360	81962	24773			
4.262	1.396	45284	7275			
4.544	1.488	106510	11479			
4.737	1.551	662194	160776	HGHT	2.6714	1242-B2
4.930	1.615	80496	20565			
5.078	1.663	599749	129282			
5.338	1.748	2377221	471090	HGHT	4.2575	1242-B3
5.612	1.838	913076	231106	HGHT	4.0278	1248-B1
5.864	1.921	17931130	1907282	HGHT	125.5437	1248-B2
6.250	2.047	187878	44216			
6.420	2.103	4605397	888555	HGHT	49.7077	1248-B3
6.628	2.171	3422718	729752			
6.762	2.215	14255705	1905095			

2.6337
1244
4

6.843	2.241	>4811868	>904896			
6.954	2.278	>4698676	>904625			
7.140	2.338	>14137677	>904173	HGHT	>97.3449	1248-B4
7.310	2.394	>4654458	>903757			
7.436	2.436	>5494919	>903450			
7.666	2.511	>5724918	>902889			
7.844	2.569	>12563459	>902456			
8.460	2.771	>53145352	>900956	HGHT	>23.4629	1254-B3
9.320	3.053	>40527699	>898859	HGHT	>20.9151	1260-B1
9.802	3.211	>11246320	>897684			
10.425	3.415	>46102253	>896166	HGHT	>10.4064	1260-B2
10.937	3.582	2713967	397632			
11.100	3.636	3420672	523323			
11.597	3.798	>45756831	>893310			
12.139	3.976	>13464495	>891991			
12.420	4.068	7104527	731486			
12.769	4.182	>15597589	>890454			
13.444	4.403	>39091604	>888809			
14.334	4.695	8129473	322566			
14.912	4.884	611891	60061			
15.268	5.001	>21945615	>884363			
16.032	5.251	1663881	105099			
16.552	5.421	1260068	91189			
16.915	5.540	>22688455	>880351			
17.723	5.805	1397180	86952			
18.183	5.956	148874	10859			
18.517	6.065	150805	15699			
18.799	6.157	32443	4392			
19.199	6.288	282751	16315			
19.770	6.475	25028	6610			

41612664	5533315	175.6290
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GROUP SUMMARY: ECD1B-DB608 1u1

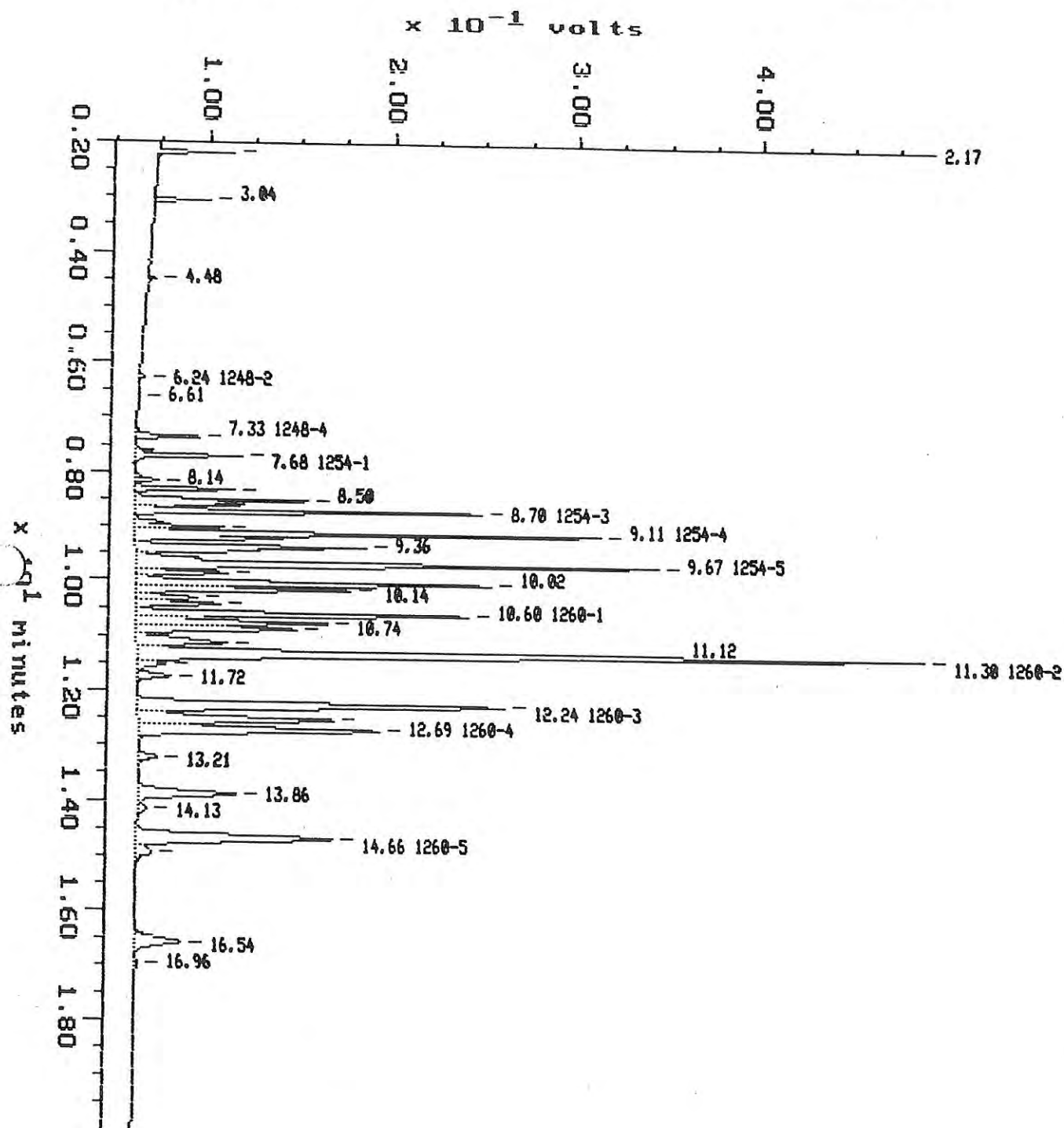
Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		4165236	920129	HGHT	3.4011	A-1242-2
		>4605397	>888555	HGHT	Invalid	A-1248-2
		>0	>0	HGHT	Invalid	A-1254-2
		>0	>0	HGHT	Invalid	A-1260-2
		>8770633	>1808684		>3.4011	

DTOL

Sample: R118 F 5000X
Acquired: 16-DEC-96 14:13
Inj Vol: 1.00

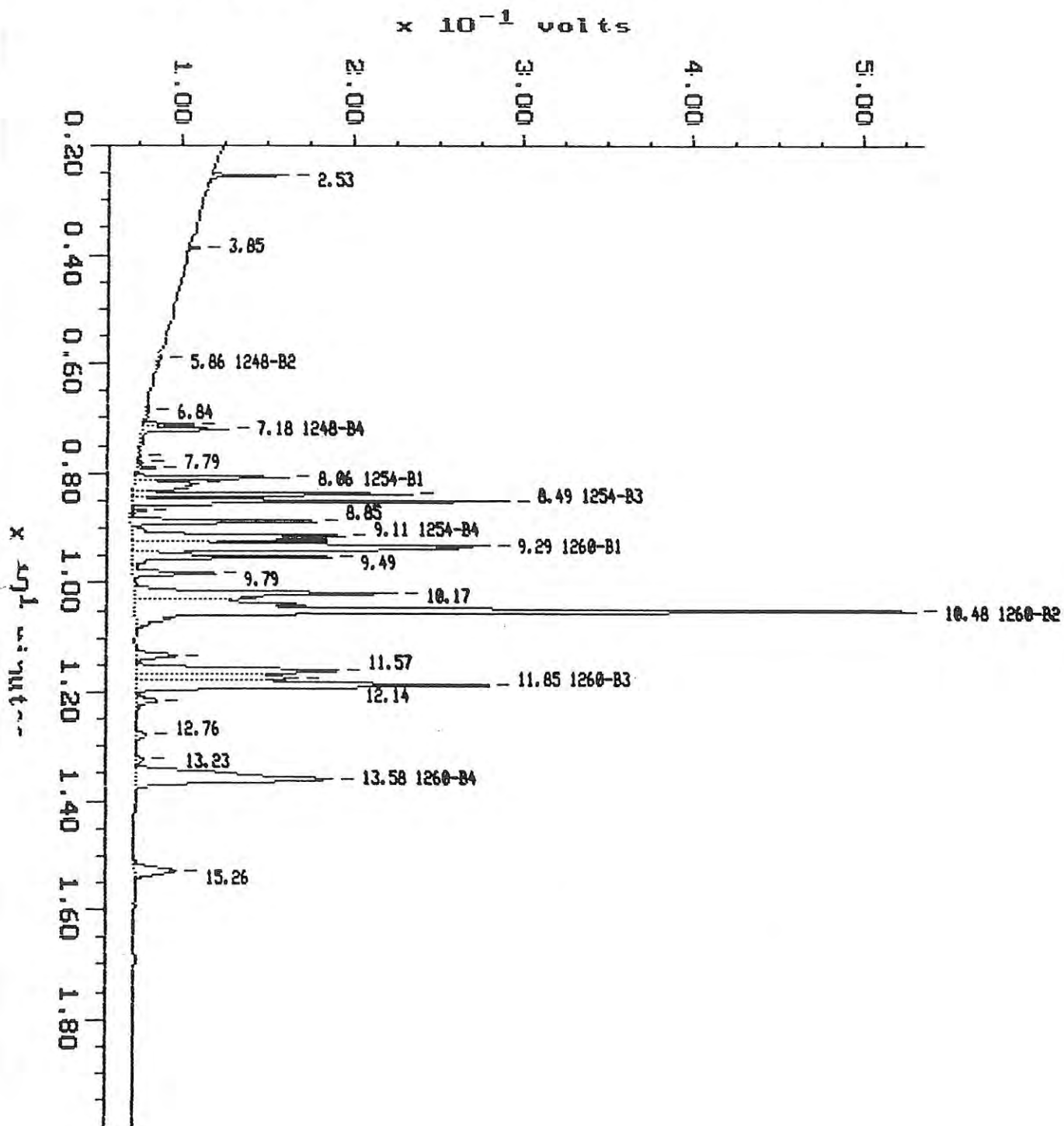
Channel: ECD1A-DB5 1u1
Method: C:\MAX\PCB\DEC16

Filename: 121612
Operator: CH



Sample: R118 F 5000X Channel: ECD18-DB608 1ul
Acquired: 16-DEC-96 14:13 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121612
Operator: CH



N-T 024711 -
Nunmore file

MAXIMA (c)1990 Dynamic Solutions, Division of Millipore

MAXIMA 820 CUSTOM REPORT

Printed: 16-DEC-1996 15:43:40

SAMPLE: R118 F 5000X

#17 in Method: PCB ANALYSIS

Acquired: 16-DEC-1996 14:13

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121612

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.171	0.128	94427	39922			
3.038	0.179	79849	30561			
4.477	0.264	12940	4410			
6.242	0.368	6969	2160	HGHT	0.0178	1248-2
6.606	0.390	1921	505			
7.325	0.432	126643	33777	HGHT	0.8122	1248-4
7.681	0.453	243856	58054	HGHT	1.4628	1254-1
8.141	0.480	50840	13143			
8.297	0.489	220406	53257	HGHT	1.7711	1254-2
8.497	0.501	553266	93038			
8.697	0.513	718879	187432	HGHT	2.6835	1254-3
8.994	0.530	241143	47043			
9.105	0.537	1304927	250131	HGHT	3.3949	1254-4
9.357	0.552	724669	123648			
9.669	0.570	1567702	282018	HGHT	3.3174	1254-5
9.847	0.581	230430	49363			
10.025	0.591	944410	191123			
10.144	0.598	542848	114661			
10.307	0.608	169946	33000			
10.418	0.614	216229	44513			
10.596	0.625	917616	179132	HGHT	4.0885	1260-1
10.744	0.634	550912	101878			
10.863	0.641	464419	85847			
11.115	0.655	370289	48288			
11.301	0.666	2621262	424416	HGHT	4.4384	1260-2
11.508	0.679	82442	15224			
11.723	0.691	107543	18276			
12.242	0.722	1428672	198149	HGHT	3.9673	1260-3
12.502	0.737	749877	104515			
12.695	0.749	930602	129075	HGHT	4.5603	1260-4
13.207	0.779	66010	9437			
13.859	0.817	434945	52428			
14.126	0.833	35390	4440			
14.660	0.864	922060	104224	HGHT	4.1141	1260-5

14.920	0.880	63166	7449
16.544	0.976	248300	23928
16.959	1.000	14213	1423

TOTAL		10060018	3159885	34.6282
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242
		133612	35937	HGHT	0.1456	A-1248
		4055770	830891	HGHT	2.8038	A-1254
		6820210	1034996	HGHT	4.2570	A-1260
TOTAL		11009593	1901824		7.2065	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.527	0.166	116366	45352			
3.854	0.253	19723	7004			
5.864	0.384	24034	2239	HGHT	Invalid	1248-B2
6.843	0.448	12814	1921			
7.095	0.465	109851	29908			
7.184	0.471	189025	50814	HGHT	1.5223	1248-B4
7.659	0.502	3707	1380			
7.785	0.510	8276	2748			
7.889	0.517	34321	11329			
8.059	0.528	335997	89260	HGHT	2.1606	1254-B1
8.178	0.536	286995	36670			
8.364	0.548	579945	162422	HGHT	2.6499	1254-B2
8.490	0.556	756021	220473	HGHT	3.3423	1254-B3
8.660	0.567	25948	8490			
8.846	0.580	394590	107661			
9.113	0.597	941304	123325	HGHT	2.9626	1254-B4
9.291	0.609	1529833	207947	HGHT	3.0712	1260-B1
9.491	0.622	524250	116106			
9.795	0.642	222226	47957			
10.166	0.666	1124537	152925			
10.485	0.687	3114433	456917	HGHT	4.3252	1260-B2
11.308	0.741	153426	24338			
11.575	0.758	899236	117330			
11.716	0.768	490957	93252			
11.849	0.776	1349707	205737	HGHT	4.1252	1260-B3

12.139	0.795	75511	11541			
12.762	0.836	38470	5687			
13.229	0.867	29519	4307			
13.585	0.890	1247902	114918	HGHT	4.0985	1260-B4
15.261	1.000	220201	23613			

TOTAL		14859121	2483572		28.2578	
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GROUP SUMMARY: ECD1B-DB608 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242-2
		213058	53054	HGHT	0.2653	A-1248-2
		2613266	595480	HGHT	2.8411	A-1254-2
		7241874	985519	HGHT	3.9217	A-1260-2
TOTAL		10068199	1634053		7.0281	



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01

DILUTION

Lab Sample ID: R118FDIL

QC Report No: R118-Dames & Moore

LIMS ID: 96-21713

Project:

Matrix: Concrete

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:

Reported: 12/17/96

Carl M. Newman

Date extracted: 12/16/96

Date analyzed: 12/16/96

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Sample Amount: 30.0 g-as-rec

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:25000

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	830,000 U
53469-21-9	Aroclor 1242	830,000 U
12672-29-6	Aroclor 1248	830,000 U
11097-69-1	Aroclor 1254	830,000 U
11096-82-5	Aroclor 1260	7,200,000
11104-28-2	Aroclor 1221	1,700,000 U
11141-16-5	Aroclor 1232	830,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

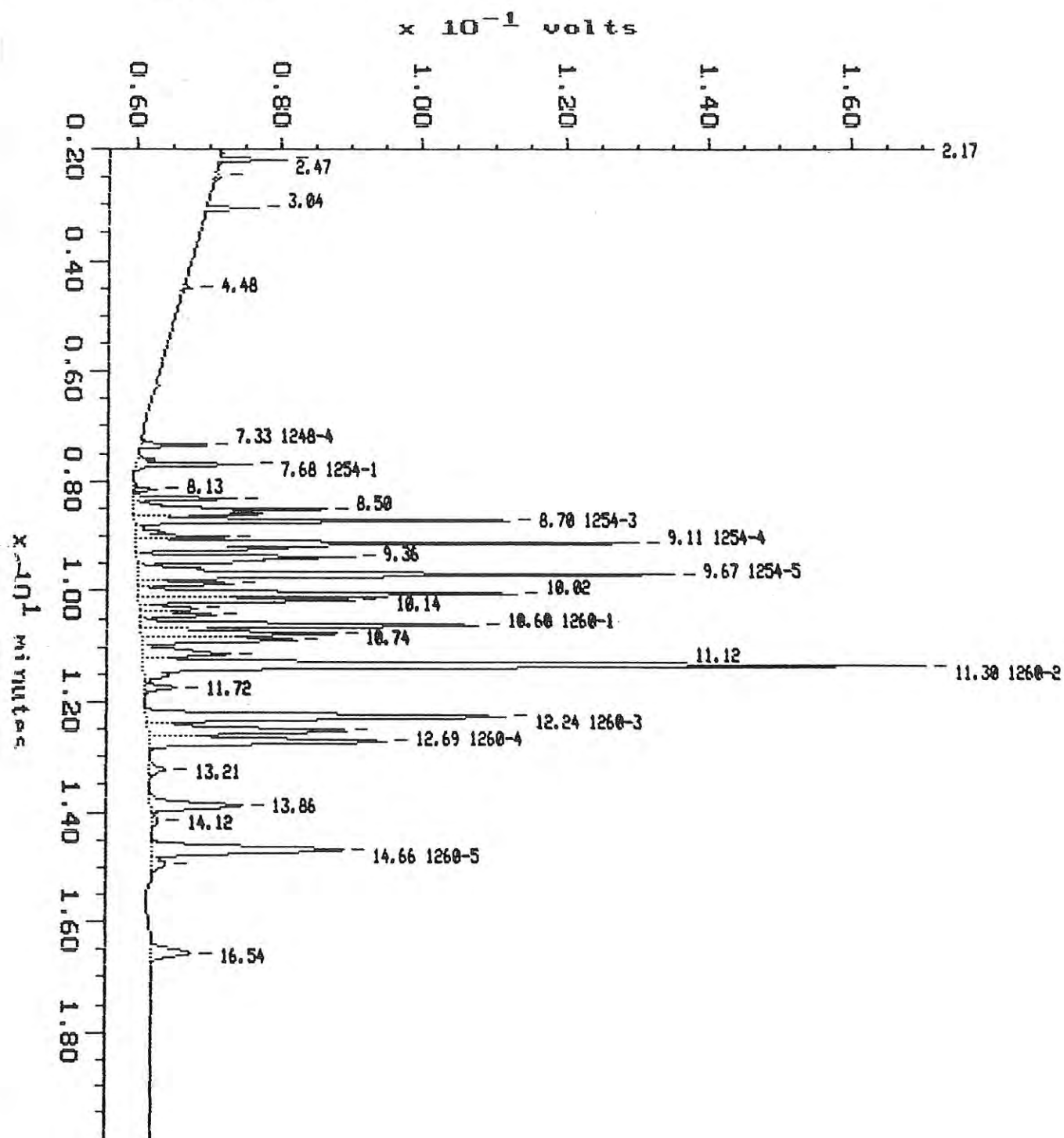
Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Sample: R118 F 25000X
Acquired: 16-DEC-96 15:15
Inj Vol: 1.00

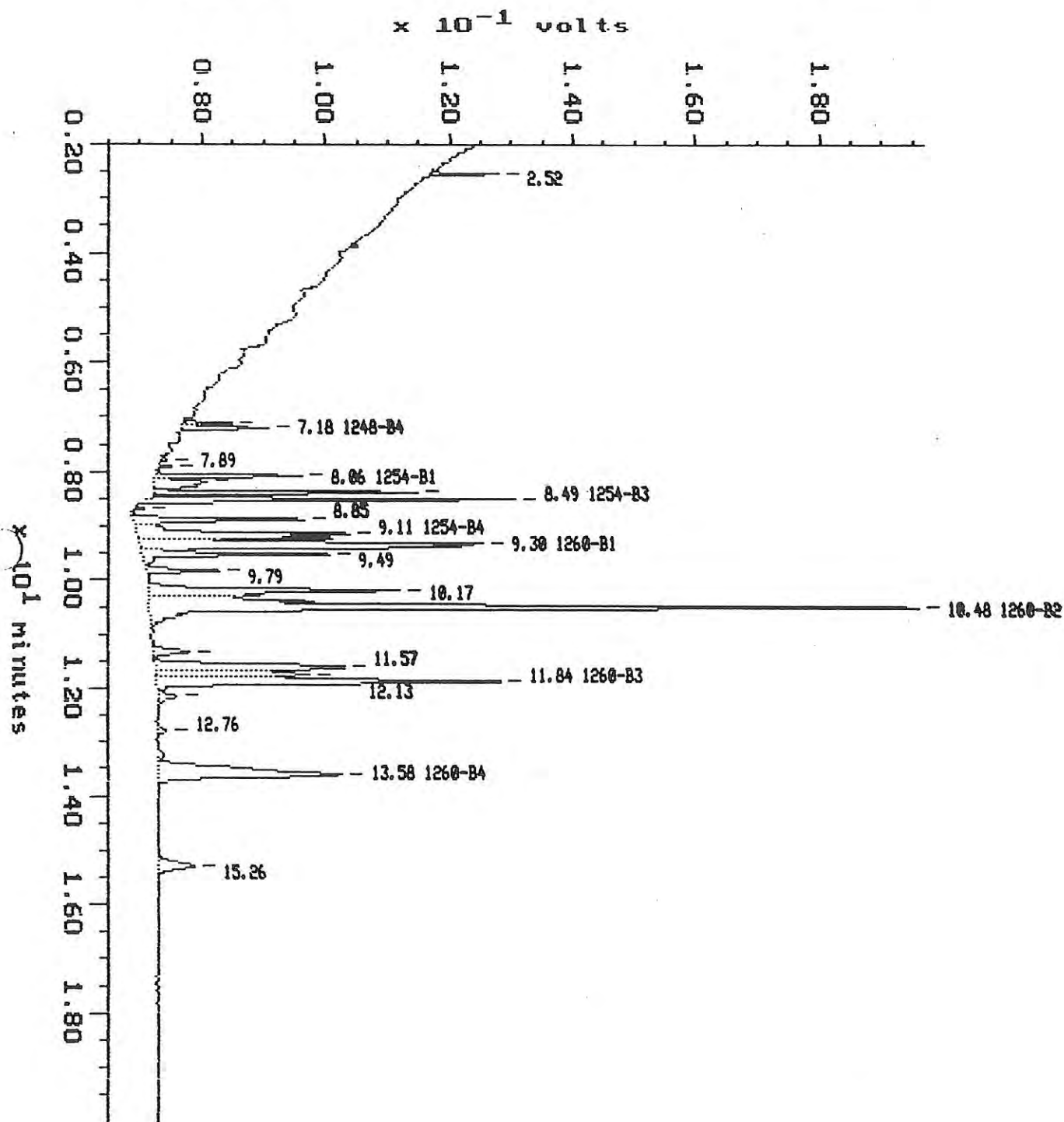
Channel: ECD1A-DB5 1u1
Method: C:\MAX\PCB\DEC16

Filename: 121614
Operator: CH



Sample: R118 F 25000X Channel: ECD1B-DB600 1u1
Acquired: 16-DEC-96 15:15 Method: C:\MAX\PCB\DEC16
Inj Vol: 1.00

Filename: 121614
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 16-DEC-1996 15:44:03

SAMPLE: R118 F 25000X

#19 in Method: PCB ANALYSIS
Acquired: 16-DEC-1996 15:15
Rate: 2.2 points/sec
Duration: 20.000 minutes
Operator: CH

Type: UNKN
Instrument: ECD1
Filename: 121614
Index: Disk
Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.171	0.131	22710	9473			
2.475	0.150	1636	585			
3.038	0.184	18382	7192			
4.477	0.271	2791	971			
7.325	0.443	32167	8984	HGHT	0.1803	1248-4
7.681	0.464	67135	16277	HGHT	0.3424	1254-1
8.134	0.492	11597	3189			
8.297	0.501	58157	14084	HGHT	0.3991	1254-2
8.497	0.514	181661	27074			
8.697	0.526	211737	52231	HGHT	0.5715	1254-3
8.994	0.544	67052	12901			
9.105	0.550	358585	70243	HGHT	0.7469	1254-4
9.357	0.566	184541	30308			
9.669	0.584	406344	74805	HGHT	0.7150	1254-5
9.847	0.595	58647	12924			
10.025	0.606	254526	52684			
10.144	0.613	140760	29828			
10.307	0.623	41101	8025			
10.418	0.638	49881	10376			
10.596	0.640	237880	46962	HGHT	0.8719	1260-1
10.744	0.649	145596	27195			
10.863	0.657	116228	21343			
11.115	0.672	90389	11975			
11.301	0.683	690103	109356	HGHT	0.9081	1260-2
11.716	0.708	24957	4204			
12.242	0.740	359477	50075	HGHT	0.8454	1260-3
12.502	0.756	191733	27516			
12.695	0.767	233538	33015	HGHT	0.9421	1260-4
13.207	0.798	14711	2143			
13.859	0.838	102227	12429			
14.119	0.853	6732	903			
14.660	0.886	228338	26707	HGHT	0.8822	1260-5
14.912	0.901	14637	1724			
16.544	1.000	56608	5485			

TCX D

0-8829

1260

0-8603

DCBP D

TOTAL	4682565	823189	7.4049
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242
		32167	8984	HGHT	0.0215	A-1248
		1101959	227640	HGHT	0.6126	A-1254
		1749335	266116	HGHT	0.8904	A-1260
TOTAL		2883461	502739		1.5245	

DETECTOR: ECD1B-DB600 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.519	0.165	25415	10875			
7.095	0.465	27121	7733			
7.184	0.471	45845	14198	HGHT	0.3572	1248-B4
7.778	0.510	4312	1144			
7.889	0.517	7280	2385			
8.059	0.528	84927	23885	HGHT	0.4897	1254-B1
8.178	0.536	60407	8227			
8.364	0.548	144872	42812	HGHT	0.5732	1254-B2
8.490	0.556	197016	59328	HGHT	0.7363	1254-B3
8.660	0.567	4412	1605			
8.846	0.580	112511	27544			
9.113	0.597	274826	34109	HGHT	0.6579	1254-B4
9.298	0.609	410241	55479	HGHT	0.6967	1260-B1
9.491	0.622	134929	30272			
9.795	0.642	51984	11798			
10.166	0.666	283799	40457			
10.485	0.687	821050	123990	HGHT	0.9596	1260-B2
11.301	0.740	36239	5898			
11.575	0.758	237527	30738			
11.716	0.768	127898	24620			
11.842	0.776	356295	55439	HGHT	0.9028	1260-B3
12.131	0.795	18128	2843			
12.762	0.836	7610	1284			
13.585	0.890	314533	29592	HGHT	0.8820	1260-B4
15.261	1.000	50867	5664			
TOTAL		3840044	651920		6.2555	

0.8603
1260

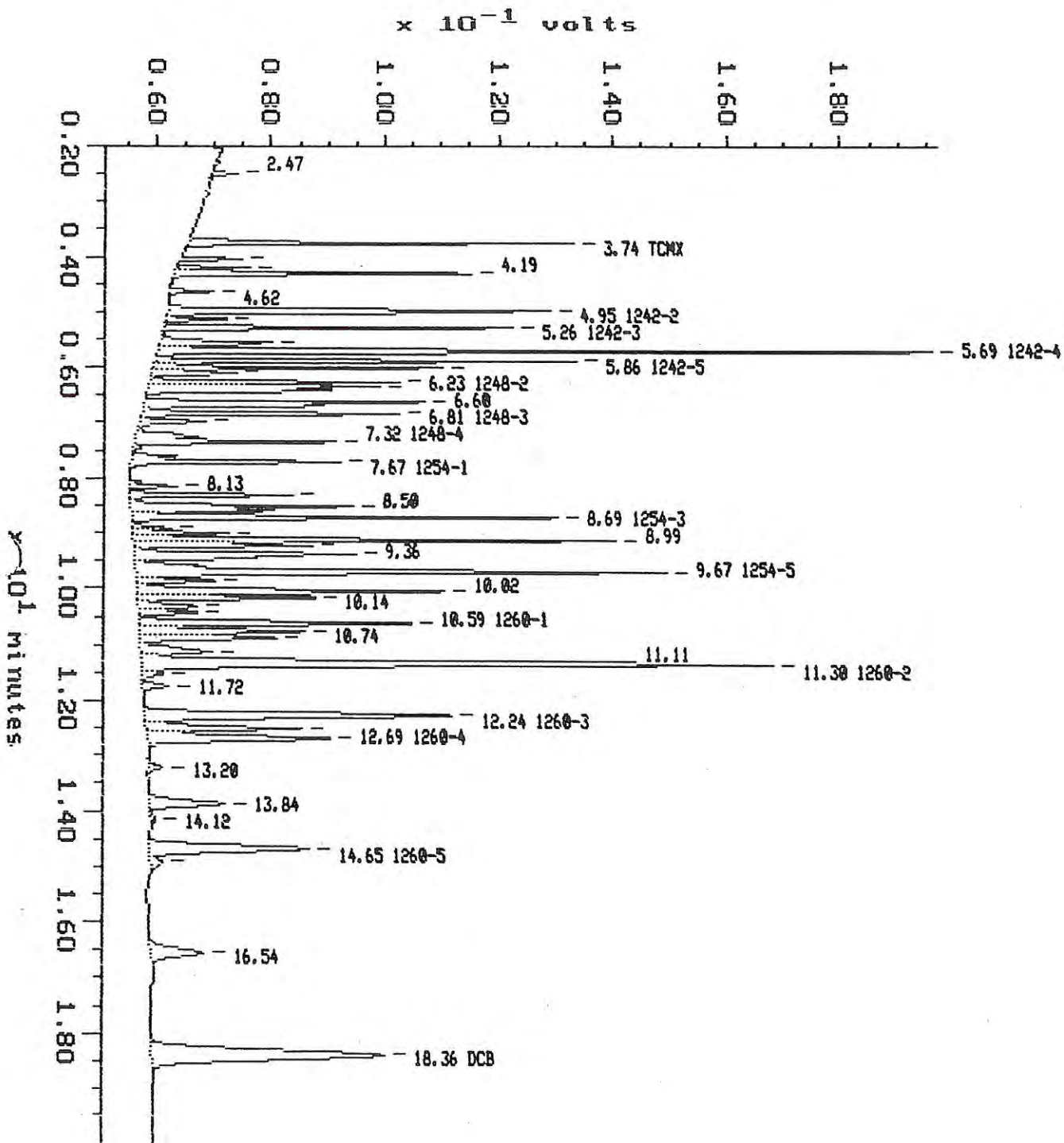
GROUP SUMMARY: ECD1B-DB600 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242-2
		45845	14198	HGHT	0.0531	A-1248-2
		701641	160134	HGHT	0.6255	A-1254-2
		1902119	264500	HGHT	0.8713	A-1260-2
		2649605	438033		1.5498	

T AL

Sample: AR1660 1.0 PPM Channel: ECD1A-DB5 1ul
Acquired: 17-DEC-96 13:59 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

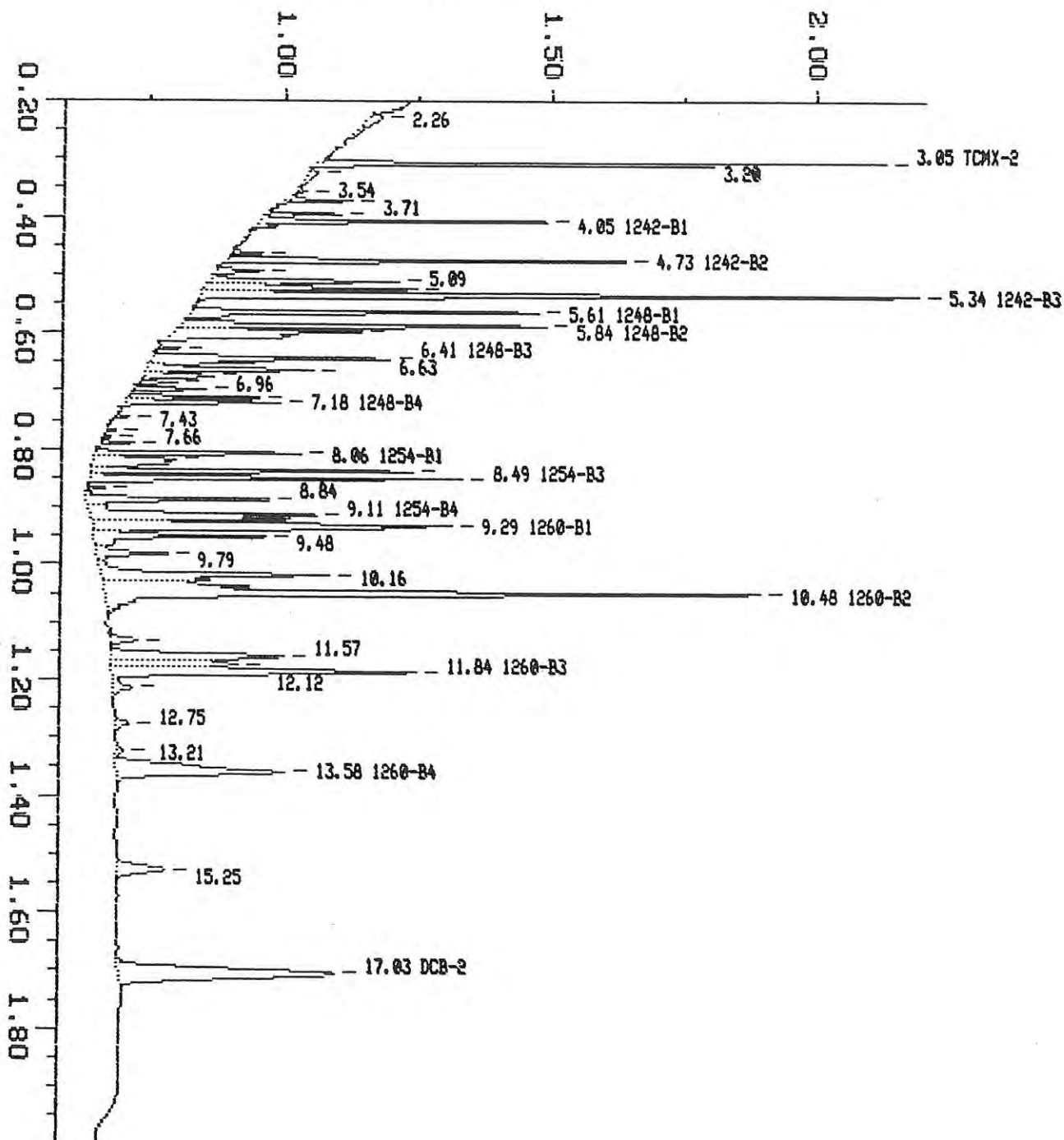
Filename: 121658
Operator: CH



Sample: AR1660 1.0 PPM Channel: ECD1B-DB608 1ul
Acquired: 17-DEC-96 13:59 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

Filename: 121658
Operator: CH

$\times 10^{-1}$ volts



MAXIMA 820 CUSTOM REPORT

Printed: 19-DEC-1996 8:50:19

SAMPLE: AR1660 1.0 PPM

#28 in Method: PCB ANALYSIS

Acquired: 17-DEC-1996 13:59

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121658

Index: 23

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.475	0.135	13651	4552			
3.736	0.203	206594	67725	HGHT	91.2540	TCMX
4.025	0.219	33436	10621			
4.188	0.228	38789	12955			
4.284	0.233	166079	52287	HGHT	0.8909	1242-1
4.618	0.252	23736	7612			
4.952	0.270	335545	66996	HGHT	0.8992	1242-2
5.122	0.279	38401	10784			
5.263	0.287	204663	61064	HGHT	0.8900	1242-3
5.523	0.301	104168	19924			
5.686	0.310	592691	135613	HGHT	0.8742	1242-4
5.857	0.319	248444	73980	HGHT	0.8591	1242-5
5.990	0.326	175340	50979	HGHT	0.8314	1248-1
6.079	0.331	50053	14899			
6.235	0.340	157521	43861	HGHT	0.8640	1248-2
6.324	0.344	254679	40414			
6.598	0.359	272142	49049			
6.806	0.371	186040	45238	HGHT	0.8527	1248-3
6.954	0.379	44845	11565			
7.318	0.399	185980	34912	HGHT	0.8427	1248-4
7.674	0.418	162606	36805	HGHT	0.8577	1254-1
8.134	0.443	31383	7875			
8.289	0.451	112966	27986	HGHT	0.8494	1254-2
8.497	0.463	233676	38521			
8.690	0.473	289511	74628	HGHT	0.8694	1254-3
8.890	0.484	26637	6483			
8.987	0.489	61238	16427			
9.098	0.495	332845	84375	HGHT	0.9212	1254-4
9.202	0.501	122434	30967			
9.357	0.510	229484	38548			
9.669	0.527	503702	93172	HGHT	0.9120	1254-5
9.839	0.536	63451	13781			
10.017	0.546	258442	53709			
10.136	0.552	147432	30891			

10.299	0.561	53083	10090			
10.411	0.567	46892	10227			
10.589	0.577	240716	47777	HGHT	0.8885	1260-1
10.744	0.585	152106	28591			
10.863	0.592	126027	23521			
11.108	0.605	89183	12037			
11.301	0.615	674363	110850	HGHT	0.9218	1260-2
11.501	0.626	17751	3329			
11.716	0.638	23758	3991			
12.235	0.666	384184	53895	HGHT	0.9146	1260-3
12.495	0.680	187734	26861			
12.687	0.691	224011	31889	HGHT	0.9075	1260-4
13.199	0.719	14364	2238			
13.844	0.754	107782	12976			
14.119	0.769	6274	887			
14.645	0.798	238416	27609	HGHT	0.9139	1260-5
14.905	0.812	15992	1882			
16.537	0.901	93322	8769			
18.361	1.000	515346	40631	HGHT	182.3833	DCB

9119905	1827247	290.3975
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1547421	389939	HGHT	0.8799	A-1242
		704881	174990	HGHT	0.8469	A-1248
		1401630	316966	HGHT	0.8920	A-1254
		1761690	272020	HGHT	0.9119	A-1260
ITAL		5415624	1153915		3.5308	

DETECTOR: ECD1B-DB600 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.260	0.133	35311	2253			
3.053	0.179	299744	106777	HGHT	93.1175	TCMX-2
3.202	0.188	25025	2007			
3.543	0.200	5331	2081			
3.706	0.218	32461	12182			
3.943	0.231	40339	13916			
4.054	0.238	186035	53524	HGHT	0.8855	1242-B1
4.618	0.271	16498	5637			
4.729	0.278	269687	75006	HGHT	0.8551	1242-B2

4.915	0.289	37025	9183			
5.093	0.299	169760	35433			
5.226	0.307	150599	39663			
5.338	0.313	588532	134546	HGHT	0.8277	1242-B3
5.612	0.329	262519	65170	HGHT	0.7927	1248-B1
5.842	0.343	267446	68296	HGHT	0.7937	1248-B2
5.946	0.349	259022	34981			
6.250	0.367	12857	4272			
6.413	0.376	234106	44453	HGHT	0.8052	1248-B3
6.628	0.389	139630	31192			
6.724	0.395	52129	13453			
6.843	0.402	20823	7467			
6.962	0.409	44689	13731			
7.088	0.416	85201	24399			
7.184	0.422	95529	28695	HGHT	0.7895	1248-B4
7.429	0.436	3187	2262			
7.659	0.450	4640	1616			
7.778	0.457	4166	1432			
7.889	0.463	20025	6521			
8.059	0.473	144166	38587	HGHT	0.8221	1254-B1
8.178	0.480	119737	15282			
8.356	0.491	215007	60019	HGHT	0.8309	1254-B2
8.490	0.498	241373	69850	HGHT	0.8812	1254-B3
8.660	0.508	9510	3225			
8.838	0.519	134127	33562			
9.113	0.535	315313	41923	HGHT	0.8354	1254-B4
9.291	0.545	473091	67283	HGHT	0.8604	1260-B1
9.483	0.557	159573	32188			
9.795	0.575	68544	13134			
10.158	0.596	324157	42614			
10.477	0.615	838223	122638	HGHT	0.9481	1260-B2
11.301	0.663	29141	5048			
11.568	0.679	248487	32116			
11.716	0.688	123940	23719			
11.842	0.695	356753	56769	HGHT	0.9265	1260-B3
12.124	0.712	24482	3368			
12.754	0.749	17745	2646			
13.214	0.776	6218	1106			
13.577	0.797	320116	31111	HGHT	0.9307	1260-B4
15.254	0.896	81693	8999			
17.034	1.000	456040	40083	HGHT	186.1308	DCB-2

TOTAL

8069748

1585419

292.0331

GROUP SUMMARY: ECD1B-DB608 1u1

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1306773	328247	HGHT	0.8334	A-1242-2

597881	141445	HGHT	0.7966	A-1248-2
915859	210378	HGHT	0.8465	A-1254-2
1988183	277801	HGHT	0.9192	A-1260-2
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4807895	957870		3.3957	

TOTAL

Sample: AR1660 1.0 PPM Channel: ECD1A-DB5 1ul
Acquired: 17-DEC-96 17:00 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

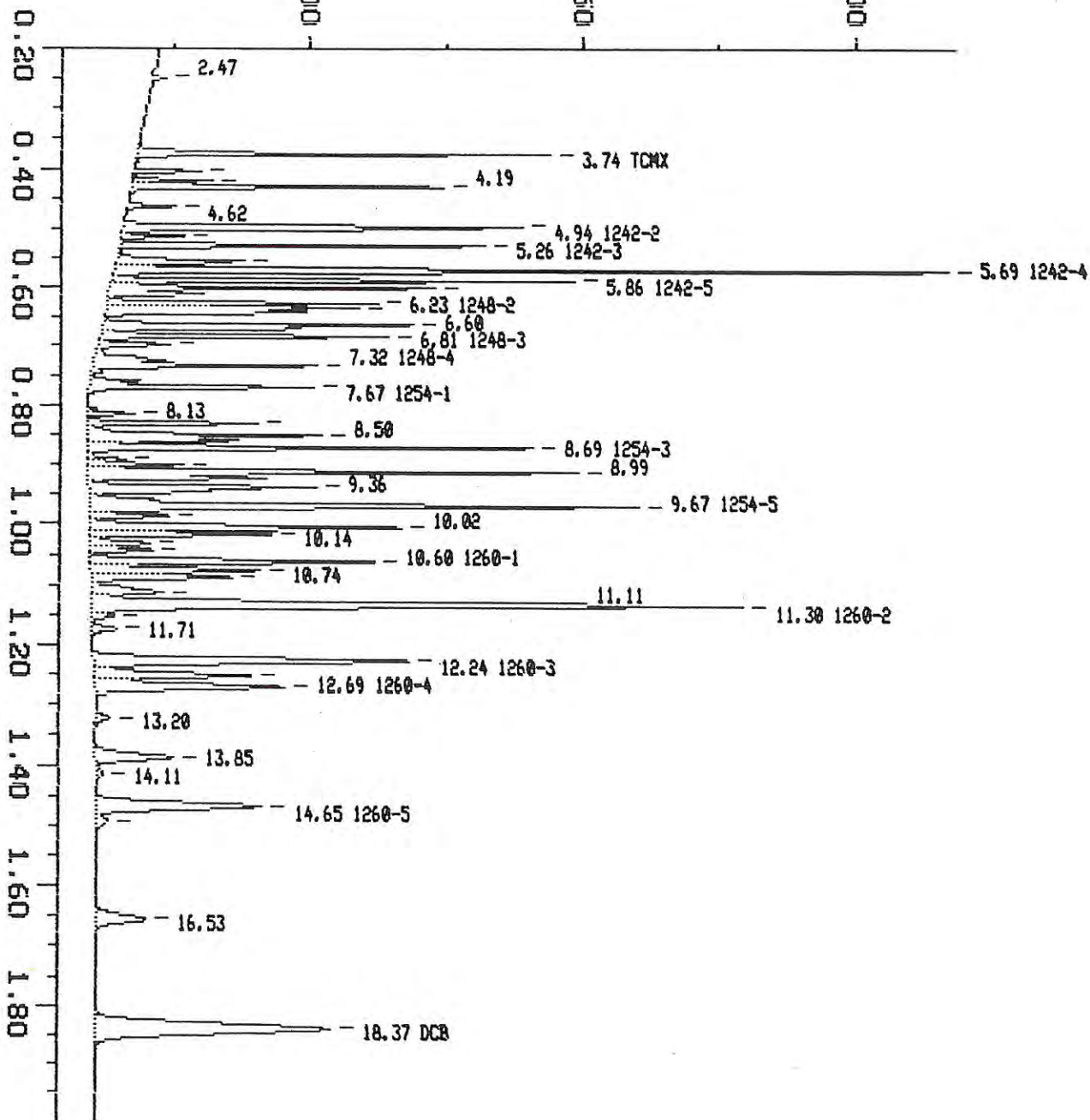
Filename: 121663
Operator: CH

$\times 10^{-1}$ volts

1.00

1.50

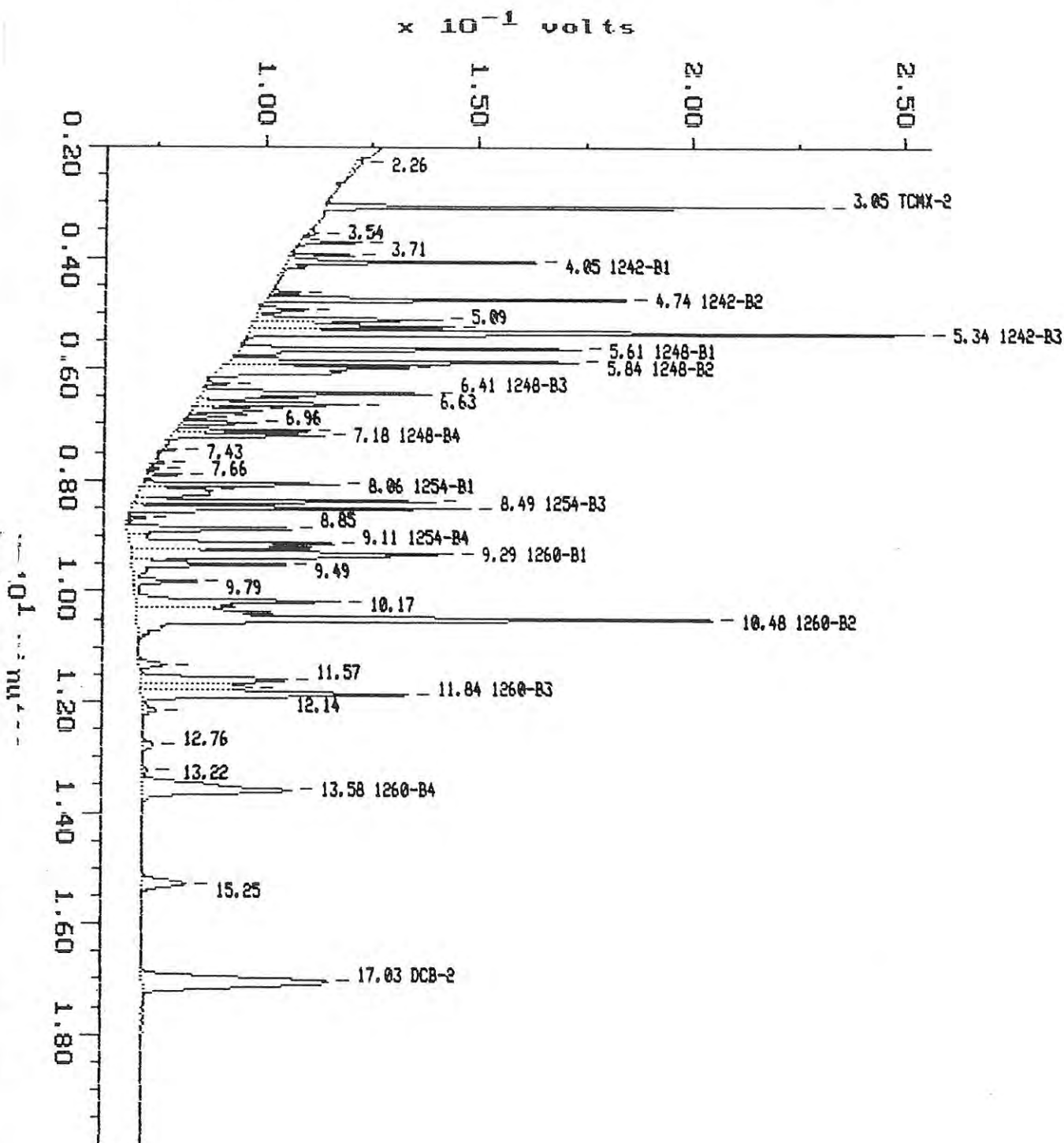
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$\times 10^1$ minutes

Sample: AR1660 1.0 PPM Channel: ECD1B-DB608 1u1
Acquired: 17-DEC-96 17:08 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

Filename: 121663
Operator: CH



MAXIMA 820 CUSTOM REPORT

Printed: 19-DEC-1996 8:50:43

SAMPLE: AR1660 1.0 PPM

#33 in Method: PCB ANALYSIS

Acquired: 17-DEC-1996 17:08

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121663

Index: 28

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.475	0.135	7998	2578			
3.736	0.203	232623	75755	HGHT	102.6138	TCMX
4.025	0.219	38281	12138			
4.188	0.228	44401	14613			
4.284	0.233	185532	57293	HGHT	0.9978	1242-1
4.618	0.251	27479	8785			
4.944	0.269	364871	73416	HGHT	1.0065	1242-2
5.122	0.279	40796	11823			
5.263	0.287	226528	66834	HGHT	0.9903	1242-3
5.523	0.301	125705	23373			
5.686	0.310	678878	152937	HGHT	1.0072	1242-4
5.857	0.319	289124	84870	HGHT	1.0091	1242-5
5.990	0.326	265172	59567	HGHT	0.9877	1248-1
6.235	0.339	178521	49397	HGHT	0.9928	1248-2
6.324	0.344	293346	46105			
6.598	0.359	323302	56977			
6.813	0.371	219204	52529	HGHT	1.0056	1248-3
6.954	0.379	52139	13477			
7.318	0.398	225603	41003	HGHT	1.0084	1248-4
7.674	0.418	184697	41122	HGHT	0.9748	1254-1
8.134	0.443	32868	8755			
8.289	0.451	129642	31450	HGHT	0.9679	1254-2
8.497	0.463	273938	42739			
8.690	0.473	320881	81786	HGHT	0.9689	1254-3
8.890	0.484	27293	6863			
8.987	0.489	65262	17769			
9.098	0.495	490723	90238	HGHT	0.9952	1254-4
9.357	0.509	245817	41795			
9.669	0.526	546858	101202	HGHT	1.0002	1254-5
9.839	0.536	66669	14747			
10.025	0.546	283782	56932			
10.144	0.552	150809	33213			
10.307	0.561	56854	11071			
10.411	0.567	52419	11376			

10.596	0.577	263682	51849	HGHT	0.9719	1260-1
10.744	0.585	164889	30897			
10.863	0.591	139802	25851			
11.108	0.605	98014	13210			
11.301	0.615	724956	119441	HGHT	1.0013	1260-2
11.501	0.626	20405	3831			
11.708	0.637	25315	4349			
12.235	0.666	410097	57955	HGHT	0.9888	1260-3
12.495	0.680	201476	28940			
12.687	0.691	243229	34423	HGHT	0.9857	1260-4
13.199	0.719	18118	2593			
13.852	0.754	122570	14203			
14.111	0.768	8152	1089			
14.645	0.797	257955	30273	HGHT	1.0086	1260-5
14.912	0.812	16098	1955			
16.529	0.900	95873	9307			
18.369	1.000	545502	43107	HGHT	194.9725	DCB

TOTAL		10104150	1967799		316.4550	
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1744934	435350	HGHT	1.0035	A-1242
		888500	202496	HGHT	0.9977	A-1248
		1672801	345798	HGHT	0.9856	A-1254
		1899920	293941	HGHT	0.9924	A-1260
TOTAL		6206154	1277585		3.9792	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.260	0.133	21032	1608			
3.053	0.179	327433	116938	HGHT	103.3586	TCMX-2
3.543	0.208	7347	2818			
3.706	0.218	52174	14939			
3.943	0.231	44709	15038			
4.054	0.238	210772	50618	HGHT	1.0066	1242-B1
4.618	0.271	17560	6232			
4.737	0.278	307447	84335	HGHT	1.0092	1242-B2
4.915	0.289	47437	11332			
5.093	0.299	216168	44030			
5.226	0.307	185655	47664			

5.338	0.313	700119	158365	HGHT	1.0101	1242-B3
5.612	0.329	324180	79709	HGHT	1.0130	1248-B1
5.842	0.343	322018	81945	HGHT	0.9799	1248-B2
5.946	0.349	330381	43643			
6.250	0.367	17456	5524			
6.413	0.376	275898	53681	HGHT	0.9951	1248-B3
6.628	0.389	168945	38152			
6.724	0.395	62930	16372			
6.843	0.402	25865	9044			
6.962	0.409	56205	16825			
7.088	0.416	106337	30420			
7.184	0.422	121085	35326	HGHT	0.9999	1248-B4
7.429	0.436	11078	3274			
7.659	0.450	5290	1935			
7.778	0.457	6974	2131			
7.889	0.463	24032	7695			
8.059	0.473	168642	45536	HGHT	0.9880	1254-B1
8.178	0.480	135820	16704			
8.356	0.491	251013	69855	HGHT	0.9844	1254-B2
8.490	0.498	276287	79123	HGHT	1.0119	1254-B3
8.660	0.508	11317	3743			
8.846	0.519	152231	37371			
9.113	0.535	369276	47414	HGHT	0.9629	1254-B4
9.291	0.545	519090	75091	HGHT	0.9705	1260-B1
9.491	0.557	175593	35337			
9.795	0.575	70647	14387			
10.166	0.597	354982	47344			
10.485	0.616	928966	134289	HGHT	1.0476	1260-B2
11.301	0.663	37851	6296			
11.568	0.679	263752	33927			
11.716	0.688	134919	25203			
11.842	0.695	395233	61764	HGHT	1.0162	1260-B3
12.139	0.713	21873	3268			
12.762	0.749	18997	2793			
13.221	0.776	5926	1107			
13.577	0.797	360863	34283	HGHT	1.0334	1260-B4
15.254	0.896	90040	9769			
17.034	1.000	498126	43223	HGHT	202.7921	DCB-2

TOTAL

9237970

1815423

321.1794

GROUP SUMMARY: ECD1B-DB608 1ul

Group Center minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		1542519	381027	HGHT	1.0009	A-1242-2
		719001	170953	HGHT	0.9889	A-1248-2
		1065219	241928	HGHT	0.9899	A-1254-2
		2204152	305427	HGHT	1.0198	A-1260-2

TOTAL

5530891

1099335

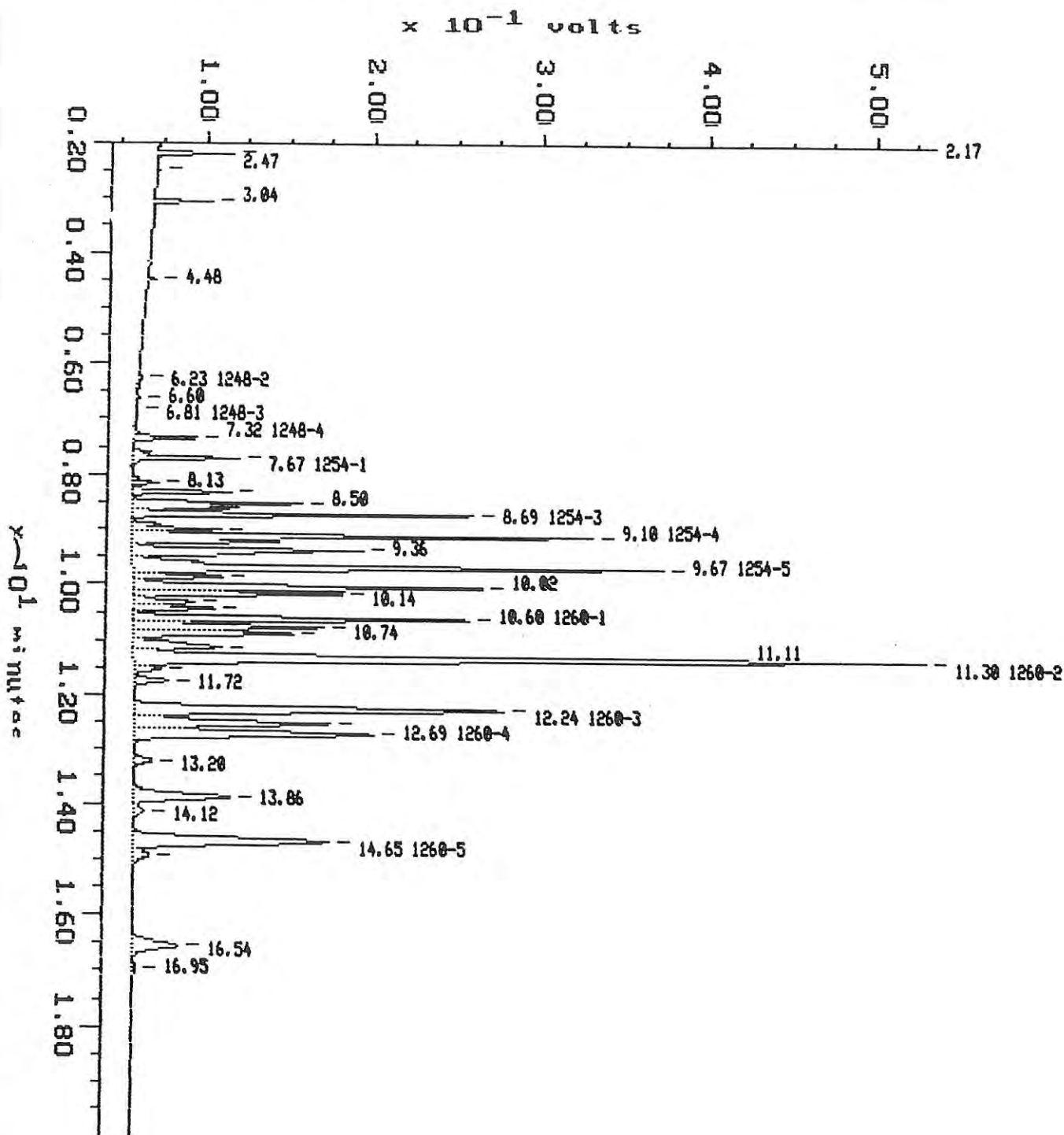
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2nd di

Sample: 0118 F 5000X
Acquired: 17-DEC-96 16:07
Inj Vol: 1.00

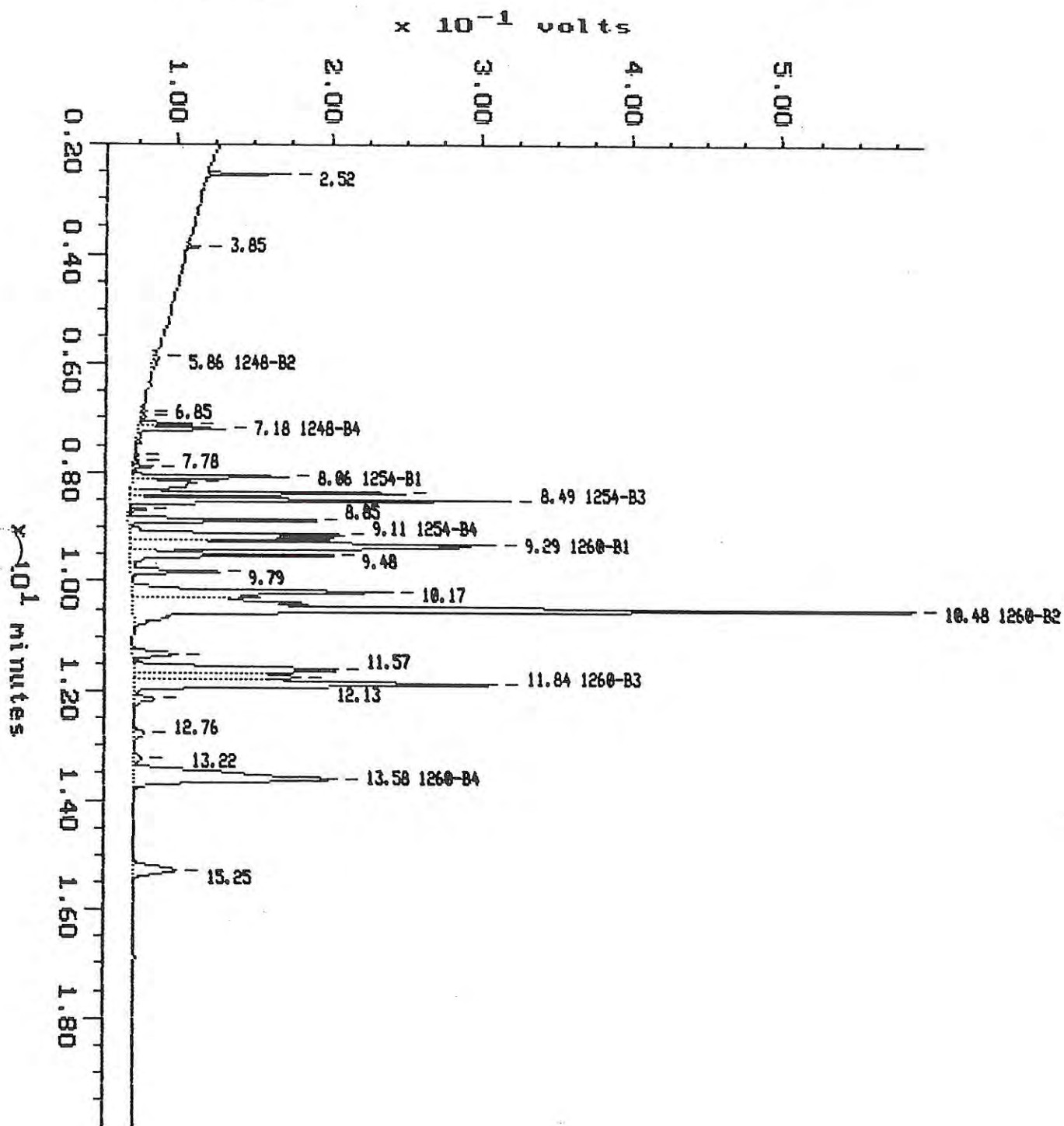
Channel: ECD1A-DB5 1ul
Method: C:\MAX\PCB\DEC16-2

Filename: 121661
Operator: CH



Sample: Q118 F 5000X Channel: ECD1B-DB608 1u1
Acquired: 17-DEC-96 16:07 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

Filename: 121661
Operator: CH



✓ 12-15-96 Consistent w/initial
C1+ dilution

MAXIMA (c)1990 Dynamic Solutions, Division of Millipore

MAXIMA 820 CUSTOM REPORT

Printed: 18-DEC-1996 8:14:04

SAMPLE: Q118 F 5000X

#31 in Method: PCB ANALYSIS

Acquired: 17-DEC-1996 16:07

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121661

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.171	0.128	106848	44124			
2.475	0.146	2489	867			
3.038	0.179	90043	34562			
4.477	0.264	14765	5067			
6.235	0.368	10851	2558	HGHT	0.0248	1248-2
6.598	0.389	2443	634			
6.806	0.401	2062	537	HGHT	Invalid	1248-3
7.318	0.432	141600	37180	HGHT	0.9039	1248-4
7.574	0.453	269902	63740	HGHT	1.6371	1254-1
8.134	0.480	61582	15331			
8.289	0.489	246322	59594	HGHT	2.0231	1254-2
8.497	0.501	586873	101396			
8.690	0.513	781006	203338	HGHT	2.9814	1254-3
8.987	0.530	261025	52716			
9.098	0.537	1441965	272995	HGHT	3.7982	1254-4
9.357	0.552	803506	136665			
9.669	0.570	1724349	315753	HGHT	3.8201	1254-5
9.839	0.580	254655	53680			
10.025	0.591	1024393	207847			
10.144	0.598	604386	124836			
10.299	0.608	184341	35974			
10.411	0.614	237328	48361			
10.596	0.625	1002201	199205	HGHT	4.6700	1260-1
10.744	0.634	600302	112556			
10.863	0.641	519097	94709			
11.108	0.655	404142	52753			
11.301	0.667	2882214	470618	HGHT	5.0637	1260-2
11.501	0.678	86130	16243			
11.716	0.691	117692	20044			
12.235	0.722	1584132	219096	HGHT	4.4820	1260-3
12.495	0.737	844222	115896			
12.687	0.748	1023629	142345	HGHT	5.1631	1260-4
13.199	0.779	77005	10973			
13.859	0.818	491506	57766			

4.8204
1260
4.6394
1260

14.119	0.833	40831	5095			
14.653	0.864	1027624	116591	HGHT	4.7234	1260-5
14.912	0.880	73573	8724			
16.537	0.975	280551	26532			
16.952	1.000	15808	1606			

TOTAL		19923393	3488510		39.2908	
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GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242
		154513	40276	HGHT	0.1660	A-1248
		4463545	915421	HGHT	3.1679	A-1254
		7519800	1147856	HGHT	4.8467	A-1260
TOTAL		12137858	2103553		8.1806	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.519	0.165	142339	53978			
3.854	0.253	25189	8559			
5.857	0.384	37528	3438	HGHT	0.0070	1248-B2
6.851	0.449	11870	3116			
6.954	0.456	12457	2923			
7.088	0.465	127204	34620			
7.184	0.471	223631	56765	HGHT	1.7345	1248-B4
7.659	0.502	10406	2174			
7.778	0.510	10105	3302			
7.889	0.517	40880	13223			
8.059	0.528	384104	101283	HGHT	2.5220	1254-B1
8.171	0.536	326541	41897			
8.356	0.548	653385	180585	HGHT	3.0236	1254-B2
8.490	0.557	855640	250230	HGHT	3.9141	1254-B3
8.660	0.568	32680	10457			
8.846	0.580	444214	122386			
9.113	0.597	1069635	140164	HGHT	3.4660	1254-B4
9.291	0.609	1747125	239609	HGHT	3.6352	1260-B1
9.483	0.622	597041	132780			
9.795	0.642	249398	56509			
10.166	0.666	1296580	171746			
10.477	0.687	3545884	516421	HGHT	5.0397	1260-B2
11.301	0.741	175779	28673			

4.639

1260

F

11.575	0.759	1009337	133240			
11.716	0.768	609980	108124			
11.842	0.776	1519775	239171	HGHT	4.9922	1260-B3
12.131	0.795	85201	13106			
12.762	0.837	48278	6940			
13.221	0.867	36984	5387			
13.585	0.891	1450831	132654	HGHT	4.8903	1260-B4
15.254	1.000	259898	27684			

TOTAL

17039898 2841152 33.2245

GROUP SUMMARY: ECD18-DB608 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242-2
		261159	60202	HGHT	0.3058	A-1248-2
		2962765	672269	HGHT	3.3024	A-1254-2
		8263615	1127856	HGHT	4.6325	A-1260-2
		11487538	1860327		8.2407	

TOTAL



ANALYTICAL
RESOURCES
INCORPORATE

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCC-01

Dilution 2

Lab Sample ID: R118F-DL2

QC Report No: R118-Dames & Moore

LIMS ID: 96-21713

Project:

Matrix: Concrete

00681-089-163

Date Sampled: 12/13/96

Date Received: 12/13/96

Data Release Authorized:

Reported: 12/18/96

Date extracted: 12/16/96

Date analyzed: 12/17/96

Sample Amount: 30.0 g-as-rec

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: No

Conc/Dilution Factor: 1:25000

Reported in Total ug/kg as received

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	830,000 U
53469-21-9	Aroclor 1242	830,000 U
12672-29-6	Aroclor 1248	830,000 U
11097-69-1	Aroclor 1254	830,000 U
11096-82-5	Aroclor 1260	7,600,000
11104-28-2	Aroclor 1221	1,700,000 U
11141-16-5	Aroclor 1232	830,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl D
Tetrachlorometaxylene D

Data Qualifiers

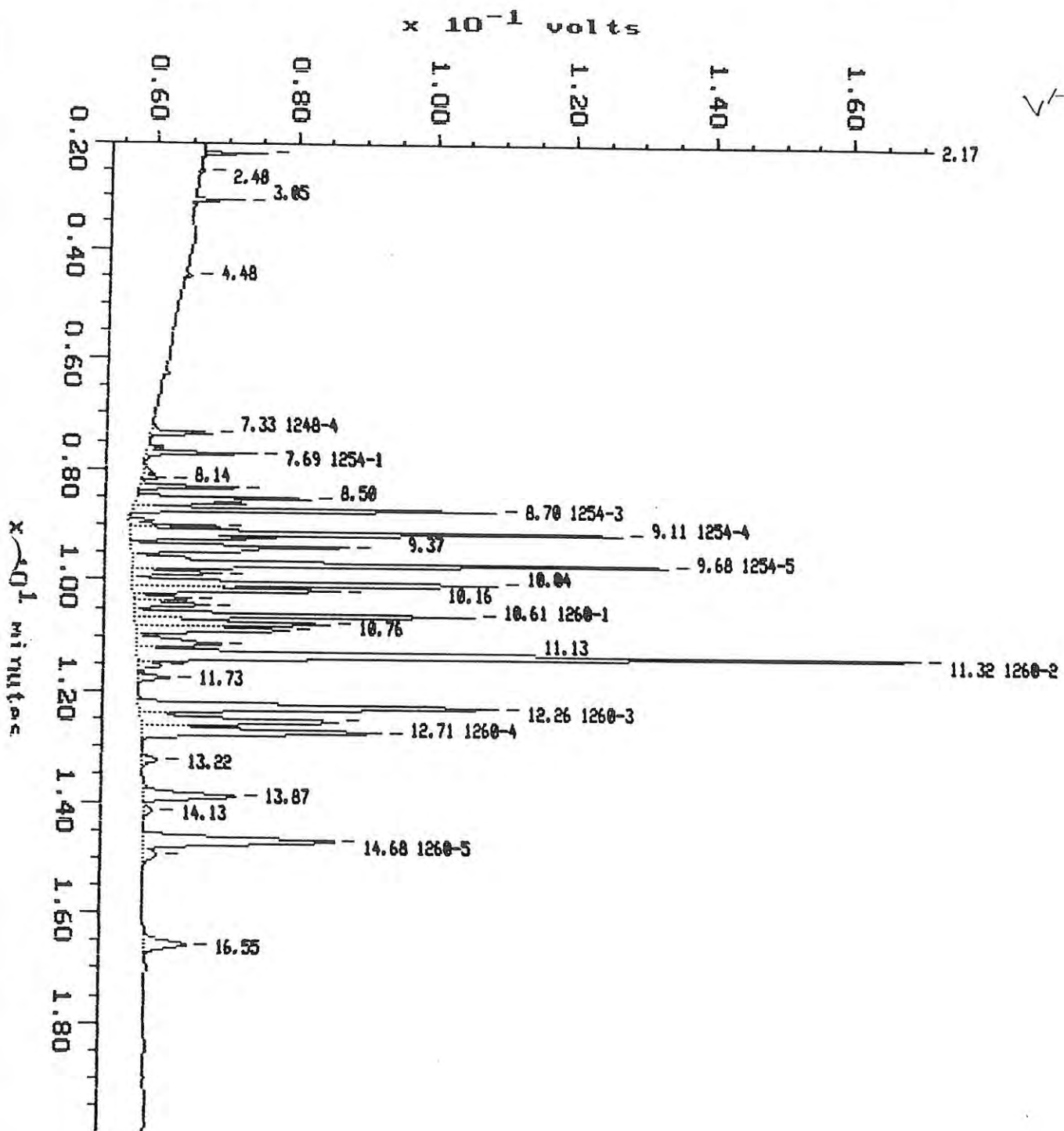
- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

2nd di

Sample: Q118 F 25000X
Acquired: 17-DEC-96 15:36
Inj Vol: 1.00

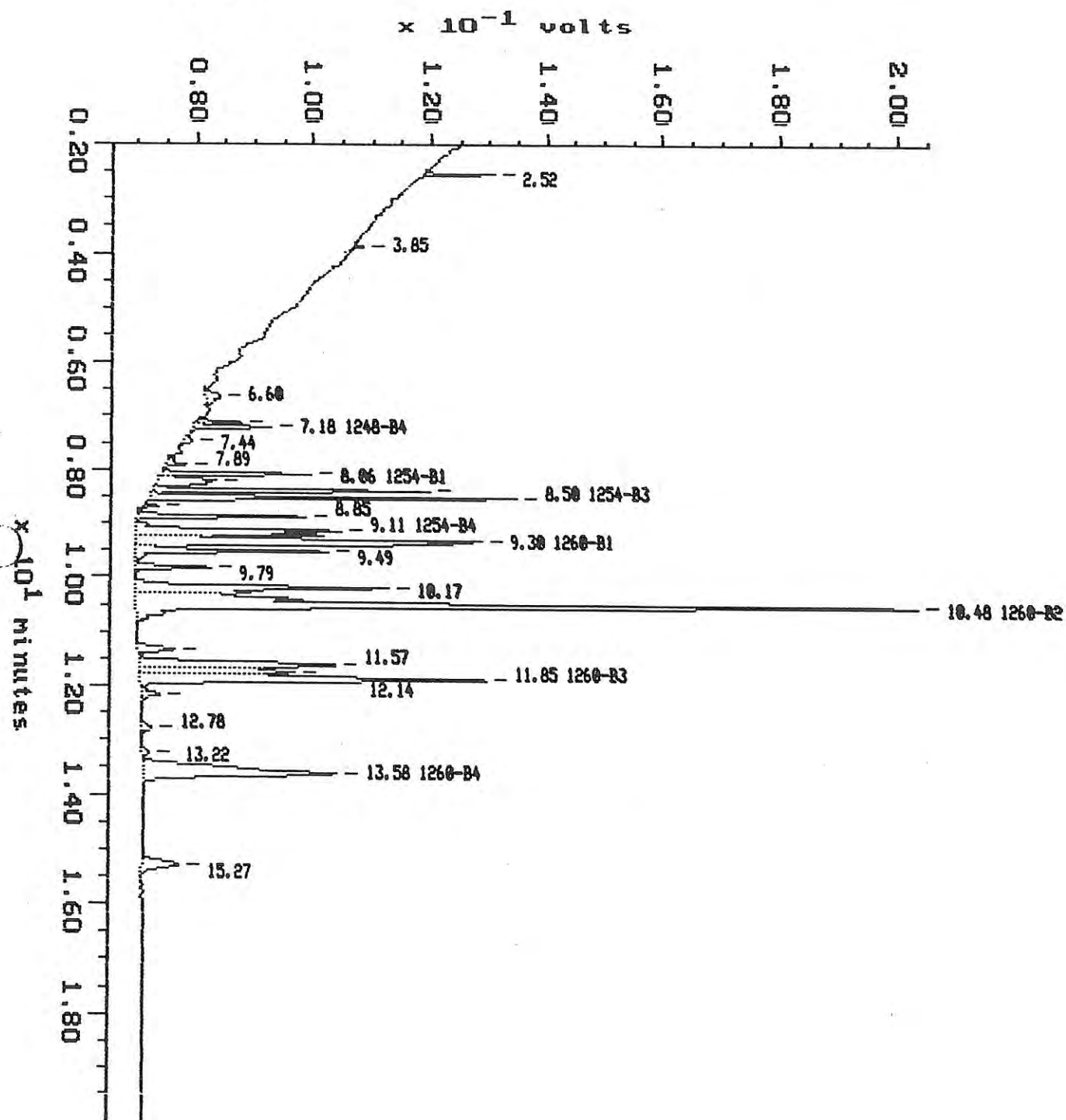
Channel: EQ1A-DB5 1u1
Method: C:\MAX\PCB\DEC16-2

Filename: 121660
Operator: CH



Sample: Q118 F 25000X Channel: ECD1B-DB608 1u1
Acquired: 17-DEC-96 15:36 Method: C:\MAX\PCB\DEC16-2
Inj Vol: 1.00

Filename: 121660
Operator: CH



Cliche didn't believe sample contained this
high of a hit, so a new dilution
was made to check for possibility of error.
Matched initial dilution.

CH 12-18-96

MAXIMA 820 CUSTOM REPORT

Printed: 17-DEC-1996 15:57:50

SAMPLE: Q118 F 25000X

#30 in Method: PCB ANALYSIS

Acquired: 17-DEC-1996 15:36

Rate: 2.2 points/sec

Duration: 20.000 minutes

Operator: CH

Type: UNKN

Instrument: ECD1

Filename: 121660

Index: Disk

Injection Volume: 1.0

DETECTOR: ECD1A-DB5 1u1

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.171	0.131	21989	9202			
2.482	0.150	1748	608			
3.046	0.184	17823	7014			
4.485	0.271	2647	919			
7.333	0.443	32940	8516	HGHT	0.1689	1248-4
7.689	0.465	61380	15622	HGHT	0.3271	1254-1
8.141	0.492	18121	3157			
8.304	0.502	55316	13885	HGHT	0.3929	1254-2
8.504	0.514	143024	24931			
8.705	0.526	197751	51874	HGHT	0.5669	1254-3
9.001	0.544	58679	12675			
9.113	0.551	358604	70270	HGHT	0.7472	1254-4
9.372	0.566	184529	31225			
9.684	0.585	409388	76426	HGHT	0.7322	1254-5
9.854	0.595	56099	12730			
10.040	0.607	252626	52040			
10.158	0.614	141186	29571			
10.314	0.623	39248	7882			
10.425	0.630	49829	10478			
10.611	0.641	239145	48355	HGHT	0.9003	1260-1
10.759	0.650	145815	27751			
10.878	0.657	119745	21950			
11.130	0.672	89568	12065			
11.315	0.684	681984	112159	HGHT	0.9338	1260-2
11.523	0.696	18105	3405			
11.731	0.709	24820	4342			
12.257	0.741	368469	51213	HGHT	0.8660	1260-3
12.509	0.756	199089	28260			
12.710	0.768	241281	34141	HGHT	0.9770	1260-4
13.221	0.799	15136	2231			
13.874	0.838	108354	13160			
14.134	0.854	8618	1073			
14.675	0.887	237383	27403	HGHT	0.9066	1260-5
14.935	0.902	14573	1782			

0.9167

1260

16.552	1.000	59548	5789	
TOTAL		4674558	834105	7.5190

GROUP SUMMARY: ECD1A-DB5 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242
		32940	8516	HGHT	0.0194	A-1248
		1082438	228077	HGHT	0.6140	A-1254
		1768261	273271	HGHT	0.9165	A-1260
TOTAL		2883639	509864		1.5498	

DETECTOR: ECD1B-DB608 1ul

Retention Time (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Component Name
2.519	0.165	37493	12386			
3.854	0.252	6250	1823			
6.598	0.432	26259	2652			
7.095	0.465	26240	7627			
7.184	0.471	48847	13736	HGHT	0.3441	1248-B4
7.444	0.488	8258	1563			
7.889	0.517	14510	3279			
8.059	0.528	92856	25408	HGHT	0.5230	1254-B1
8.186	0.536	73793	9995			
8.364	0.548	161218	47092	HGHT	0.6360	1254-B2
8.497	0.557	214604	62798	HGHT	0.7837	1254-B3
8.660	0.567	8101	2514			
8.846	0.579	101156	29063			
9.113	0.597	257379	34930	HGHT	0.6763	1254-B4
9.298	0.609	431848	58836	HGHT	0.7429	1260-B1
9.491	0.622	140853	32926			
9.795	0.642	55365	12846			
10.166	0.666	308390	43321			
10.485	0.687	893160	133634	HGHT	1.0420	1260-B2
11.308	0.741	39038	6285			
11.575	0.758	261412	33487			
11.723	0.768	138122	26568			
11.849	0.776	374924	58858	HGHT	0.9638	1260-B3
12.139	0.795	17378	2944			
12.776	0.837	9084	1502			
13.221	0.866	6592	1063			
13.585	0.890	344360	33086	HGHT	0.9945	1260-B4

0.8358

15.268

1.000

55792

6277

TOTAL

4153282

706498

6.7063

GROUP SUMMARY: ECD1B-DB608 1ul

Group Center (minutes)	Relative Time	Peak Area	Peak Height	Base	Solution Conc (ug/ml)	Group Name
		0	0	HGHT	0.0000	A-1242-2
		48847	13736	HGHT	0.0506	A-1248-2
		726056	170228	HGHT	0.6692	A-1254-2
		2044293	284413	HGHT	0.9432	A-1260-2
TOTAL		2819197	468377		1.6630	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

23 January 1997

Steve Hitch
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RECEIVED
JAN 24 1997

~~THE~~ DAMES & MOORE
SEATTLE

RE: Client Project: 00681-089-163
ARI Job #R447

Dear Steve:

Please find enclosed the original Chain-of-Custody (COC) record and final results for samples from the above referenced project. Two soil samples were received in good condition on 1/21/97. The samples were analyzed for PCBs as requested.

It was noted prior to extraction that both of these samples consisted primarily of small rocks. Representative portions of each were used for extraction. Both extracts were acid and mercury cleaned prior to analysis.

Carryover was detected in the Method Blank from the analysis of a previous sample. The Method Blank was re-analyzed without incident. The results for the re-analysis only have been submitted for the Method Blank.

There were no further problems with these analyses.

A copy of this package will be kept on file by ARI. Should you have any questions or problems, please feel free to call me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/340-2866, ext. 113

Enclosures

cc: file #R447

MDH/mdh



Chain of Custody

Date 1/21/19 Page 1 of 1

Sampler's Signature: Jeffrey H. H. H.

15/11/2014

[illegible]

Special Instructions/Comments:

Relinquished by:

74

(Sia) 

Р. С. ДУГА. Н. С. И.

(Printed) 21E1700 V1/1A

(Company) DAVES & MOORE

(Time) 1500 (Date) 1/21/91

Received by (lab):

... ..

(Sia) Kit Gardner

11/1/2019

(Printed) KIE 79401001

(Company) ARIT

(10) Time / 570

Sample Receipt

Total no. of containers:

Chain of custody seals.

On the basis of the above, the following are the main findings of the study:

good condition/cold:

Conforms to record:



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: R447MB

LIMS ID: 97-776

Matrix: Soil

QC Report No: R447-Dames & Moore

Project:

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized: *[Signature]*
Reported: 01/22/97

Date extracted: 01/21/97

Date analyzed: 01/22/97

Sample Amount: 30.0 g-dry-wt

Final Ext Vol: 10 mL

pH: NA

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Conc/Dilution Factor: 1:1

Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 85.0%

Tetrachlorometaxylene 92.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCA1

Lab Sample ID: R447A

LIMS ID: 97-776

Matrix: Soil

QC Report No: R447-Dames & Moore

Project:

00681-089-163

Date Sampled: 01/21/97

Date Received: 01/21/97

Data Release Authorized: *[Signature]*

Reported: 01/22/97

Date extracted: 01/21/97

Date analyzed: 01/22/97

Sample Amount: 29.8 g-dry-wt

Final Ext Vol: 10 mL

pH: 6.0

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Conc/Dilution Factor: 1:1

Percent Moisture: 0.7 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	34 U
53469-21-9	Aroclor 1242	34 U
12672-29-6	Aroclor 1248	34 U
11097-69-1	Aroclor 1254	34 U
11096-82-5	Aroclor 1260	21 J
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	34 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 89.0%

Tetrachlorometaxylene 88.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCCSA2

Lab Sample ID: R447B

LIMS ID: 97-777

Matrix: Soil

QC Report No: R447-Dames & Moore

Project:

00681-089-163

Date Sampled: 01/21/97

Date Received: 01/21/97

Data Release Authorized: *Hyler*

Reported: 01/22/97

Date extracted: 01/21/97

Date analyzed: 01/22/97

GPC Cleanup: No

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Conc/Dilution Factor: 1:1

Percent Moisture: 1.5 %

Sample Amount: 29.8 g-dry-wt

Final Ext Vol: 10 mL

pH: 7.0

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	34 U
53469-21-9	Aroclor 1242	34 U
12672-29-6	Aroclor 1248	34 U
11097-69-1	Aroclor 1254	34 U
11096-82-5	Aroclor 1260	340
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	34 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 90.0%

Tetrachlorometaxylene 87.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: R447
LIMS ID: 97-776
Matrix: Soil

QC Report No: R447-Dames & Moore
Project: 00681-089-163

Data Release Authorized: *Reph*
Reported: 01/22/97

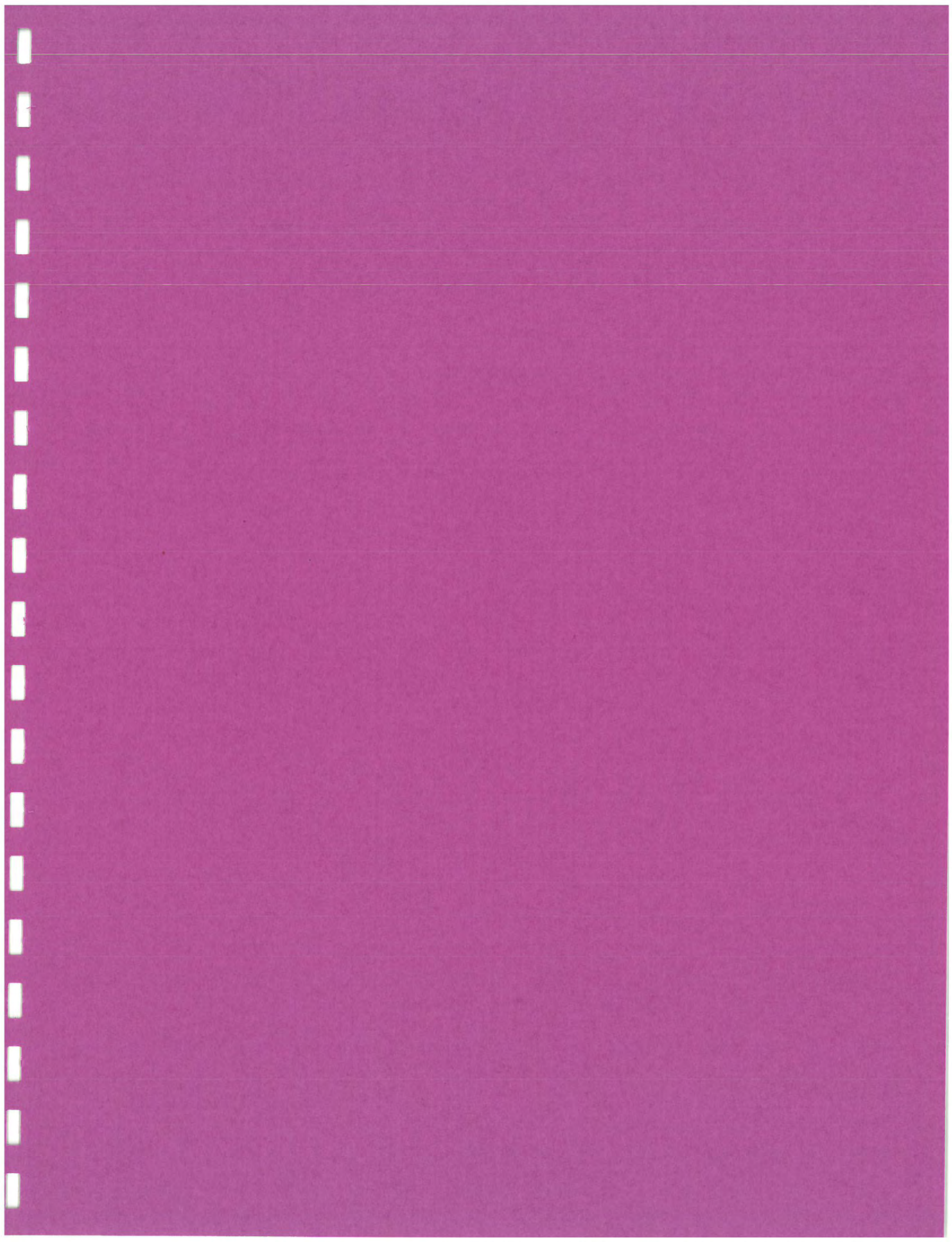
LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 01/21/97

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	252	333	75.6%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	88.0%

Values Reported in Total ug/kg Dry Weight





Analytical Resources, Incorporated
Analytical Chemists and Consultants

11 March 1997

Steve Hitch
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RECEIVED
177 13 1237
ANALYTICAL RESOURCES
SEATTLE

RE: Client Project: 00681-089-163
ARI Job #R821

Dear Steve:

Please find enclosed the original Chain-of-Custody (COC) record and final results for samples from the above referenced project. Three wipe samples were received in good condition on 3/4/97. The test for Sample MCC-Blank was canceled per Joanne Yan Gwo on 3/6/97. The remaining samples were analyzed for PCBs as requested.

There were no problems with these analyses. The units that were reported on the original faxed data to you were incorrect. They, and the corresponding reporting limits, have been corrected.

A copy of this package will be kept on file by ARI. Should you have any questions or problems, please feel free to call me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

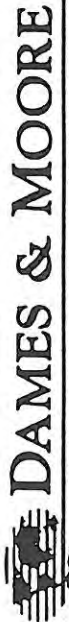
Mark D. Harris

Mark D. Harris
Project Manager
206/340-2866, ext. 113

Enclosures

cc: file #R821

MDH/mdh



Chain of Custody

Date 3/4/91 Page 1 of 1[illegible]

2007-05-15



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INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: R821MB

QC Report No: R821-Dames & Moore

LIMS ID: 97-2945

Project:

Matrix: Wipes

00681-089-163

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 03/11/97

Date extracted: 03/05/97

GPC Cleanup: No

Date analyzed: 03/06/97

Florisil Cleanup: No

Sample Amount: 1.00 Wipes

Sulfur Cleanup: No

Final Ext Vol: 10 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 64.0%
Tetrachlorometaxylene 77.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-701

Lab Sample ID: R821A

LIMS ID: 97-2945

Matrix: Wipes

QC Report No: R821-Dames & Moore

Project:

00681-089-163

Date Sampled: 03/04/97

Date Received: 03/04/97

Data Release Authorized:

Reported: 03/11/97

Catharine M. Moore

Date extracted: 03/05/97

Date analyzed: 03/06/97

Sample Amount: 1.00 Wipes

Final Ext Vol: 10 mL

GPC Cleanup: No

Florisil Cleanup: No

Sulfur Cleanup: No

Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 45.0%
Tetrachlorometaxylene 55.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MCC-702

Lab Sample ID: R821B
LIMS ID: 97-2946
Matrix: Wipes

QC Report No: R821-Dames & Moore
Project:

00681-089-163

Date Sampled: 03/04/97

Date Received: 03/04/97

Data Release Authorized:
Reported: 03/11/97

Date extracted: 03/05/97
Date analyzed: 03/06/97
Sample Amount: 1.00 Wipes
Final Ext Vol: 10 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1

Reported in Total ug/Sample

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 48.0%
Tetrachlorometaxylene 65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector.
Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

APPENDIX C

Terracon – PCB Soil and Concrete Remediation Specification, Section 02 84 50,
Addendum 3 - December 10, 2015

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Contractor shall provide all labor, materials, account for coordination with Owner (UW), equipment, services, utility or power shutdowns, permits and insurance required to complete the handling, cleanup, removal, packaging, loading and proper disposal of PCB-contaminated concrete and soils as indicated below and on Figure 1 (attached to this section).
1. Portions of the existing concrete slabs, walls and the soil below the concrete slabs are contaminated with PCBs in the following rooms:
 - a. North Tower, Ground Floor, room G056:
 - b. Central Tower, Ground floor, room G046B, portions of room G046 adjacent to room G046B, and northwest corner of room G046A:
 - c. South Tower, Ground Floor, room G021:
 2. The attached Figure 1 shows the approximate extent of PCB contamination in the rooms/areas listed above.
 3. The PCB site assessment report will be issued prior to notice to proceed.
 4. PCB concentrations in the concrete and soil under the slabs in the electrical transformer rooms and surrounding the Central electrical transformer room are between 2 ppm and 50 ppm as indicated in the specific areas shown on Figure. Concrete floor slabs are approximately four to six (4-6) inches in thickness.
 5. PCB contaminated soils are anticipated to exist to approximately 24 inches below the underside of the concrete slab floor of the transformer rooms as indicated in specific areas shown on Figure 1 (attached to this section).
 6. PCB concentrations in concrete located beyond the remediation zones indicated on Figure 1 contain <2 ppm PCBs and are considered "construction debris".
 7. Previous remediation included either cleaning, removal of the top 1/8" of concrete, followed by encapsulation, or complete slab removal. Based on past remediation, exposed concrete surfaces in the work areas are not considered PCB-containing.
 8. Access to PCB work areas is limited related to overhead construction, structural elements, mechanical systems and lay-down areas.
 9. Coordinate PCB remediation work with demolition specified elsewhere and protection of PCB remediation areas during such demolition.
 10. Coordinate the Work with waste profiling and confirmation soil sampling to be performed by the Owner's Environmental Consultant as outlined below. Waste will require staging for specific periods to facilitate waste profiling (if required). Remediation areas will require protection for specific periods outlined below to facilitate confirmation sampling of remaining soils.
 11. Additional excavation or removal may be required contingent upon confirmation sample data. Any work in addition to that specified herein will be performed as a change to the contract at a cost mutually negotiated by the Owner and Contractor.
 12. Based on available hydro-geological data, it is not anticipated that groundwater will be encountered or affected by PCB-related work.

- B. Remove, load in UW-approved containers to be provided by the Contractor, transport and properly dispose of approximately twenty one (21) tons of PCB-contaminated concrete and soil containing >2 ppm PCBs and <50 ppm PCBs (i.e. "State Special Waste") from rooms/areas listed above and as indicated on Figure 1 at the end of the section. Dispose of "State Special Waste" at a UW-approved "Subtitle D" landfill permitted to accept such waste. Refer to Section 3.3 for information on disposal requirements.
1. Included in the scope of remediation of materials containing \geq 2 ppm PCBs and <50 ppm PCBs are the following items:
 - a. Concrete floor slabs measuring approximately 50 square feet in the South tower and 25 square feet in the North tower, for a total of 75 square feet;
 - b. Base of concrete masonry unit (CMU) walls (from floor to 12 inches above floor) measuring approximately 15 linear feet in the Central tower, 4 linear feet in the North tower and 7 linear feet in the South tower, for a total of 26 linear feet of wall;
 - c. Underlying soil beneath slabs in the Central tower (approximately 7 cubic yards) and North tower (approximately 5 cubic yards) totaling approximately 16 tons/ 12 cubic yards.
- C. Remove, load in containers to be provided by the Contractor, transport and properly dispose of concrete and soil containing <2 ppm PCBs (i.e. "Construction Debris") from rooms/areas listed above and as indicated on Figure 1 at the end of the section. Dispose of "Construction Debris" at a municipal landfill permitted to accept such waste. Refer to Section 3.3 for information on disposal requirements

1.2 RELATED SECTIONS

- A. Work related to this Section is described in:
1. Section 01 11 01 – Summary of Work – Regulated Materials
 2. Section 02 80 00 – Facility Remediation
 3. Section 02 82 00 – Asbestos Removal
 4. Section 02 83 00 – Heavy Metals Control Activities
 5. Section 02 84 00 – Polychlorinated Biphenyl Remediation

1.3 DEFINITIONS

- A. Authorized Visitor: The Owner or designated representative, or a representative of any regulatory or other agency having jurisdiction over the project, and having required training, medical approval, fit test, etc.
- B. Controlled Area: Area that only qualified and properly protected workers or authorized visitors has access.
- C. Decontamination Area: Enclosed area adjacent and connected to controlled/regulated work area, consisting of an equipment room and clean room, which is used to decontaminate workers, materials, and equipment. Where PCB removal is done in conjunction with asbestos or lead abatement, the decontamination area for asbestos or lead may be used for this purpose.

- D. Disposal: Procedures necessary to transport and deposit the PCB materials in an approved waste disposal site in compliance with EPA and other applicable regulations. Disposal Site shall be an Owner approved and designated landfill, incinerator or recycling company for PCB-containing waste.
- E. Owner's Environmental Consultant: Argus Pacific, Inc., 1900 W. Nickerson St., Ste 315, Seattle, WA 98119.
- F. MSDS: Material Safety Data Sheet supplied by manufacturer provides information on a product listed in OSHA 29 CFR 1910.1200(g)(2).
- G. Polychlorinated Biphenyls (PCBs): A class of chlorinated hydrocarbon compounds containing a variable number of chlorine atoms. Commercially available products contain mixtures of as many as 40 to 70 PCB compounds (isomers). A compound containing more than 2 ppm of PCBs is considered to be PCB-containing. PCBs range from oily liquids to white, crystalline solids to hard, non-crystalline resins or waxy solids.
- H. Waste Shipment Records: Form similar to *Uniform Hazardous Waste Manifest*, or an EPA approved state form.

1.4 DOCUMENTS INCORPORATED BY REFERENCE

- A. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the most stringent requirements shall apply.
 - 1. U.S Environmental Protection Agency Toxic Substance Control Act, TSCA, (Code of Federal Regulations Title 40, Part 761)
 - 2. U.S Environmental Protection Agency Office of Toxic Substances Guidance Document, *Summary of PCB Regulations*, EPA Document No. 910-S-94-002.
 - 3. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA, 40 CFR 1910.120.
 - 4. RCRA, Resource Conservation and Recovery Act, 40 CFR Part 761, Subpart D.
 - 5. Washington State Department of Ecology, Dangerous Waste Regulations, Chapter 173-303 WAC
 - 6. CERCLA, Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et.seq.)
 - 7. MTCA, Model Toxics Control Act, Chapter 70.105 D RCW
 - 8. MTCA Cleanup Regulation, Chapter 173-340 WAC
 - 9. Dangerous Waste Regulations, Chapter 173-303 WAC
 - 10. Federal and State DOT regulations governing transport of PCB-contaminated media.
 - 11. Washington Industrial Safety and Health Act (WISHA)
 - 12. All local ordinances, regulations, or rules pertaining to contaminated soil or groundwater, including storage, transportation, and disposal.

1.5 SUBMITTALS AND NOTICES

- A. Submit "Pre-Job Submittals" to the Owner 10 working days prior to notice to proceed. The Work may not proceed until the complete pre-job submittal package has been reviewed by the Owner and Environmental Consultant.
1. Site Specific Health and Safety Plan (HASP): Prepare a project HASP developed and implemented in association with the Contractor's standard construction safety program and certified by a Certified Industrial Hygienist (CIH) in good standing. HASP will comply with all aspects of WAC 296-843-120 (Health and Safety Plan), and will include information specific to worker training, protection and decontamination related to PCB contamination. HASP is to be distributed to all on-site employees performing work in the vicinity of PCB-contaminated media, who are to read it or have it read to them if they are unable to read it themselves, sign a compliance agreement and abide by all of its provisions. The HASP shall address safe and proper handling of contaminated soils and concrete. HASP shall include procedures to address groundwater, which is not anticipated, and surface water runoff/rain.
 2. HASP shall include at a minimum the following items:
 - a. Name, signature and stamp of Certified Industrial Hygienist
 - b. Name and signature of Contractor's designated Safety Representative
 - c. Site description and location;
 - d. Site Control measures as identified on a site map;
 - e. Pre-entry briefings to be held prior to initiating any work in areas of known contamination, and at other times to ensure that workers are apprised of HASP provisions and that such a plan is adequate and being followed;
 - f. Chemical hazard analysis to identify and establish appropriate procedures for addressing suspected conditions or activities that may pose routine occupational hazards or immediate danger. The HASP shall describe the risks associated with each task and the actions to be taken to mitigate hazards;
 - g. Contaminated Media Zones, including exclusion and support zones. Describe procedures to inform all necessary personnel of Contaminated Media Zone requirements. Include specific criteria and contaminant thresholds for establishing Contaminated Media Zone(s);
 - h. Levels of personnel protection to be employed during the Work, including, but not limited to: thresholds and criteria for choices of protective clothing, equipment and respiratory protection (as appropriate) based on the types and concentrations of contaminants and anticipated exposure pathways;
 - i. A program for the determination of personnel exposure monitoring requirements as needed, listing target contaminants and associated monitoring equipment;
 - j. Decontamination procedures for personnel, materials and equipment. Include description and general locations of decontamination facilities;
 - k. Description of the equipment and procedures to prevent releases of contaminated media to the soil and water from construction equipment and materials. Include description of equipment and procedures to be used to immediately clean up and contain releases;

- I. Procedures and coordination of temporary storage, containerization, handling and disposal of any contaminated media in accordance with this Specification and all applicable local, State and Federal regulations.
 - m. Emergency Response Plan for safe and effective response to emergencies which establishes emergency procedures including, but not limited to: escape routes, signals for evacuation, emergency communications, and response to fire or explosions. Describe emergency equipment and facilities available off-site;
 - n. Definition of appropriate levels of training and training procedures to promote a safe working environment, including any training requirements defined by applicable regulations or codes;
 - o. Medical surveillance program for eligible employees consistent with 29 CFR 1926.65(f).
 3. Contaminated Media Management Plan (CMMP): Provide a CMMP specific to the project site which includes a detailed description of the location, amount and types of media to be remediated, and the means and methods, and estimated duration(s), of the planned remediation work. Include the solid waste disposal facility where contaminated media will be disposed of, and the offsite haul routes used to transport contaminated media to the facility. Include proposed locations for temporary storage of waste containers as specified. Discuss coordination with demolition as specified elsewhere. All proposed changes, deletions or addition to the CMMP shall be submitted to the Owner and Environmental Consultant prior to implementation.
- B. Periodic Job Submittals:
 1. Daily Logs: Submit daily logs to the Owner and Environmental Consultant prior to the start of the next work shift. Daily logs shall indicate the names and times of all Contractor personnel at the project site, including delivery personnel and authorized visitors to the project site. Indicate the location and depth of all contaminated media excavation, estimated in-place volumes (cubic yards) of contaminated soils excavated, locations of any temporary contaminated media stockpiles, the volume of contaminated media placed in or removed from each stockpile, and the locations, depth and nature of any unanticipated contaminated media encountered or observed and the response taken by the Contractor.
 2. Contaminated Media Documentation: Use a bill of lading for each offsite shipment of contaminated media within the Contractor's scope of disposal. Bill of lading shall include the date and time of shipment, name of transport company, name of driver, disposal site, location from which contaminated media was loaded on truck, waste profile permit number from disposal/treatment facility, and brief description of contaminated media. Contractor is to confirm that each bill of lading has correct waste profile permit indicated prior to shipment leaving the site. Provide bills of lading and associated weight ticket from disposal facility showing weight/volume of contaminated media received to the Owner and Environmental Consultant within 24 hours of shipment from the project site.
- C. Post-Job Submittals shall be delivered to the Owner within 30 days of completion of work and shall include the following:
 1. Certification: Provide written certification from the Contractor's Project Manager or Supervisor that Contractor has fully inspected the work area and completed work in strict accordance with the Specifications.

2. Project Record Documents: Provide project records including documentation of all contract changes, and copies of worksite entry log books, safety logs, sign-in sheets, and supervisor's daily field reports.
 3. Disposal Manifests: Compile and submit copies of ALL waste disposal transportation and disposal manifests for "State Special Waste", including signed receipts from the landfill, and chain-of-custody.
- D. The UW EHS will provide the proper notification to EPA regarding PCB activity and waste disposal as required.
- E. Refer to EPA, OSHA, and other standards referenced herein for further information and regulatory requirements not included above.

1.6 PERSONAL PROTECTION AND TRAINING

- A. Personnel Protective Equipment for PCB Removal, shall include, but not limited to:
1. PCB-resistant gloves and clothing, eye, hearing, head and fall protection as necessary.
 2. Half-face mask, negative-pressure respirator with disposable particulate filtration cartridge (P-100). Protection factor: 10
 3. Provide additional personnel and respiratory protection to minimize any possible exposure from inhalation. Refer to below testing limits for all worker exposure requirements for PCBs.
- B. Worker Decontamination Area
1. Where PCB remediation is performed in conjunction with asbestos, lead abatement or other hazardous materials abatement, a multiple use decontamination area shall be established.
 2. The Contractor shall provide a decontamination/emergency clean up area consisting of PCB-resistant sheeting (drop cloth) with absorbent material and other necessary equipment. Washing facilities with hot water and cleanser that is capable of removing oily compounds without injury to human skin.
- C. Worker Safety and Health: The Contractor shall comply with the following provisions:
1. The content of WAC 173-340-810 (Model Toxics Control Act Cleanup Regulation, Worker Safety and Health). WAC 173-340-810 states the requirements under the Occupational and Safety Health Act (OSHA) and the Washington Industrial Safety and Health Act (WISHA) are applicable to the excavation and handling of contaminated soil/groundwater.
 2. The Contractor performing excavation and loading of contaminated soil/groundwater shall prepare a site-specific Health and Safety Plan that addresses the presence of the contaminants described in this specification. Refer to Section 1.5 SUBMITTALS AND NOTICES in this Specification.
 3. Workers involved in excavation and handling of contaminated soil and concrete shall be in compliance with Hazardous Waste Operations and Emergency Response (HAZWOPER) Training in accordance with WAC 296-62. Workers shall be trained in the purpose, proper selection, fitting, use, and limitations of personal protective equipment (PPE), including gloves, protective clothing and respirators.

1.7 SAFETY

- A. With regard to the Work of this contract, the safety of the Contractor's employees, the Owner's employees, and the public is the sole responsibility of the Contractor.

1.8 LIABILITY

- A. The Contractor is an independent contractor and not an employee of the Owner, Architect or Environmental Consultant. The Owner, Architect and the Environmental Consultant shall have no liability to the contractor or any third persons for the Contractor's failure to faithfully perform and follow the provisions of these Specifications and the requirements of the governing agencies. Notwithstanding the failure of the Owner, Architect or the Environmental Consultant to discover a violation by the Contractor of any of the provisions of these Specifications, or to require the Contractor to fully perform and follow any of them, such failure shall not constitute a waiver of any of the requirements of these Specifications which shall remain fully binding upon the Contractor.

1.9 QUALITY ASSURANCE

- A. Environmental Consultant may perform periodic inspections to observe work, handling and packaging procedures. Environmental Consultant may perform surface wipe, bulk and air testing for PCBs to determine possible contamination and environmental exposure, and verify that PCB levels are not exceeded.
- B. The Owner shall notify the Contractor in writing to stop work if the Owner determines that work practices are in violation of the Specifications or work is endangering workers and occupants of the building. The Contractor shall continue work when conditions and actions are corrected and when written authorization is received from the Owner.
- C. Waste Profiling
 - 1. The waste profiles will be based on initial results of in-situ sampling conducted by the Environmental Consultant, reviewed and approved by UW EH&S. If new/unidentified areas are identified during removal the Environmental Consultant will collect samples of suspected PCB-contaminated material during excavation for use in completion of additional required waste profiles. Such sampling will be performed on an as-needed basis at the sole discretion of the Environmental Consultant and Owner. Coordinate with the Owner and Environmental Consultant to facilitate sample collection.
 - 2. Stage new/unidentified containerized waste on-site for up to ten (10) working days pending waste profile approval.
 - 3. Final waste characterization will be provided by Owner and Environmental Consultant as part of the EPA-approved work plan.
- D. Confirmation Sampling
 - 1. Environmental Consultant will collect samples of in-situ soils and concrete following excavation/removal to determine completeness of remediation in accordance with the EPA-approved work plan. Coordinate with the Owner and Environmental Consultant 24 hours prior to completion to facilitate confirmation sample collection.
 - 2. Restrict access to PCB work areas for up to three (3) working days following sample collection to facilitate analysis and review of data. Do not impact PCB work areas in any manner until written direction is provided by the Owner/Environmental Consultant.

3. Additional excavation or removal may be required contingent upon confirmation sample data. Any work in addition to that specified herein will be performed as a change to the contract at a cost to be mutually negotiated by the Owner and Contractor.

1.10 TESTING LIMITS

- A. PCB levels for airborne, cleanup and hazardous waste disposal are as follows:
 1. Worker airborne concentrations below $1\mu\text{g}/\text{m}^3$ (microgram per cubic meter) or pre-abatement background levels, where available.
 2. Concentrations below 2 parts per million for general construction solid waste disposal.
 3. Concentrations below 1 part per million for cleanup of contaminated soils per Table 740-1, WAC 173-340-900.

PART 2 - PRODUCTS

- 2.1 Plastic Sheet: Plastic sheeting shall be flame-retardant polyethylene material. It shall not dissolve on contact with PCB compounds or any chemicals used by the contractor for abatement/decontamination. The minimum thickness shall be 6-mil.
- 2.2 Storage Containers: Storage containers shall be suitable to receive and retain any PCB-containing or contaminated materials until disposal at an approved site. They shall comply with container specifications set forth in 49 CFR 178.80, 178.82, 178.102 or 178.116. Containers shall be labeled with waterproof print and permanent adhesive in accordance with WAC, OSHA, DOT, UN and EPA regulations.
- 2.3 Warning labels on all disposal containers/drums shall be according to EPA Region 10 Toxic Substance Section, PCB Regulation. The Contractor will provide waste containers and labels for all waste materials.
- 2.4 Warning Signs: Unless other signs or security access is provided, and for temporary measure, warning signs shall be provided and displayed at each regulated area during Work to warn of the presence of PCBs. Upon completion of cleanup and clearance, these barriers and warning signs shall be removed.
- 2.5 Cleaning detergent or degreaser: Owner approved product – Simple Green Industrial Cleaners and Degreasers (biodegradable) or TSP solution to remove staining on concrete substrate and electrical equipment. Provide in the submittal package all MSDS for products to be used to complete the project.
- 2.6 All Necessary tools and equipment to complete the remediation and cleanup efforts

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

- A. Utility Locate: Schedule a utility locate of the project areas a minimum of 48 hours in advance of planned site work.

- B. Controlled Area and Decontamination Facilities: Before beginning excavation of contaminated media, establish a controlled area around the planned excavation. Establish and demarcate entry/exit locations and describe them in HASP and CMMP outlined above.
 - 1. Equipment may move freely within Controlled Area.
 - 2. Decontamination is not required for movement within Controlled Area.
 - 3. Decontamination prior to exiting controlled area shall consist of brooming away loose soil and removal of any significant quantities of adhered soil with hand tools.
 - 4. As feasible, locate truck loading areas at a perimeter of Controlled Area. Broom-clean trucks before leaving loading area.
 - 5. Personnel exiting controlled area shall decontaminate per HASP.
 - C. Temporary Protection: The Contractor shall install adequate protection to prevent damage to concrete and soil to be removed during any demolition or other site operations to occur prior to remediation. Such measures shall be adequate to enable removal of any debris or material that may be stockpiled on the remediation zone without impacting existing concrete or soil to be remediated. Coordinate temporary measures with demolition specified elsewhere or required to facilitate the Work.
 - D. Temporary Staging Areas: Establish facilities for temporary staging of excavated media pending testing of concrete and/or soils prior to transport for disposal/treatment. Install runoff control measures per CMMP.
 - E. Access to Work Area by Others: Except for emergency personnel, the Contractor shall limit access to the Controlled Area to authorized visitors.
 - F. Personnel Protection: Ensure proper eyewear, gloves, boots and any other required safety equipment per the Site Specific HASP are in use at all times.
 - G. Emergency Precautions
 - 1. First Aid: The Contractor shall be prepared to administer first aid to injured personnel after decontamination.
 - 2. Contractor shall provide fire extinguishers at project work area.
- 3.2 REMOVAL OF PCB-CONTAMINATED MEDIA
- A. Remove contaminated concrete using means and methods as described in the CMMP and HASP required above. Minimize slurry runoff and distribution of debris.
 - B. Excavate contaminated soils in a manner that prevents commingling with uncontaminated soil. Minimize movement of excavation equipment over or through contaminated soil to prevent commingling.
 - C. Maintain excavation equipment in good working order. Prevent spillage of oil, fuel or hazardous substances from equipment and maintain an appropriately sized spill kit at the site. Promptly repair oil leaks from equipment and clean up any contaminated media.
 - D. Obtain coverage under the Construction Stormwater General Permit and conform to all requirements.

- E. Load contaminated soils within controlled area into containers to be provided by the Contractor. Refer to staging requirements and holding times for waste profiling as outlined above.
- F. Load contaminated soil into trucks or containers in a manner that prevents spilling or tracking of contaminated soils into non-contaminated areas. Do not store contaminated soil in drums.
- G. Remove loose material from trucks or containers before trucks leave loading areas. Broom trucks clean before they leave the loading areas. Any contaminated soil collected in loading areas shall either be placed into trucks or back onto stockpile(s).
- H. Cover all trucks or containers prior to leaving loading areas. Do not spill or track contaminated media offsite at any time.
- I. Utilize pre-approved or designated truck routes established in conjunction with other Work to be performed under the Contract Documents.
- J. Ensure loaded truck or containers weights are within acceptable limits.
- K. Comply with all applicable local, State, or Federal Regulations, codes or ordinances governing or regulating transportation of contaminated substances.
- L. Ensure that all drivers of vehicles transporting contaminated substances have in their possession during transport all applicable Washington State and local vehicle insurance requirements, valid commercial driver's license, and vehicle registration and license.
- M. Ensure all drivers of transport vehicles are informed of the nature of material being transported in form of written manifest and required haul routes to and from off-site disposal facility.
- N. Trucks or containers shall be substance-compatible, licensed and permitted pursuant to Federal, State and local requirements for transportation of contaminated media.

3.3 DISPOSAL

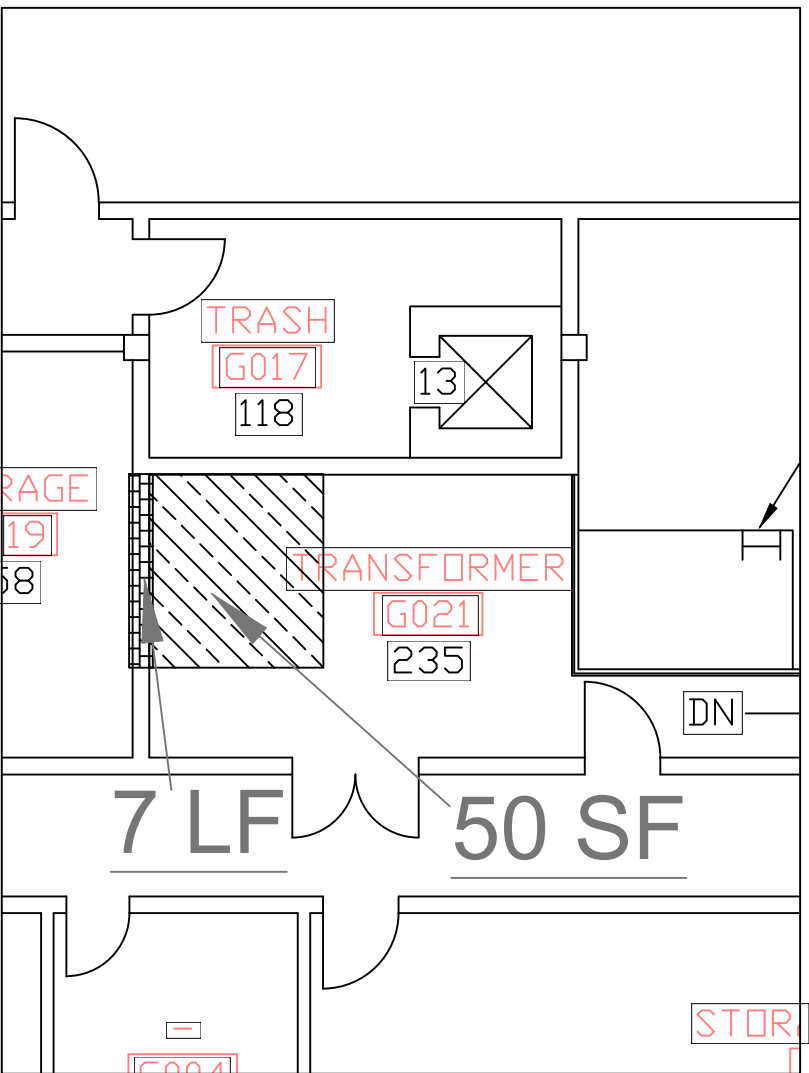
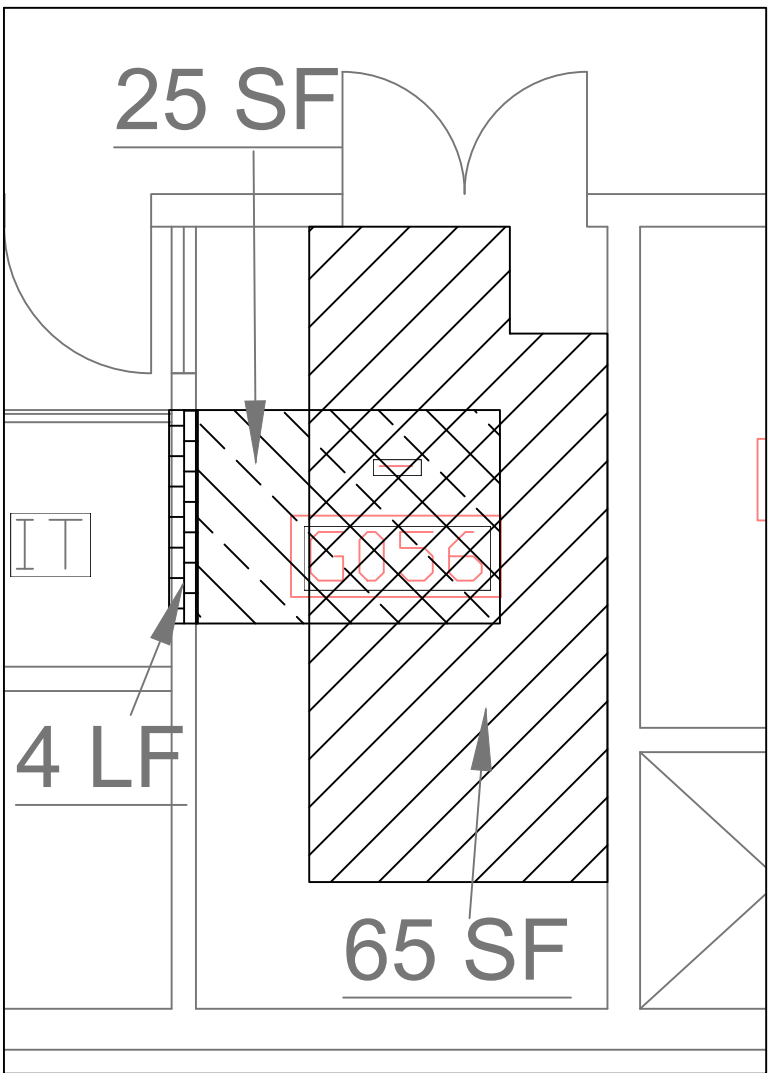
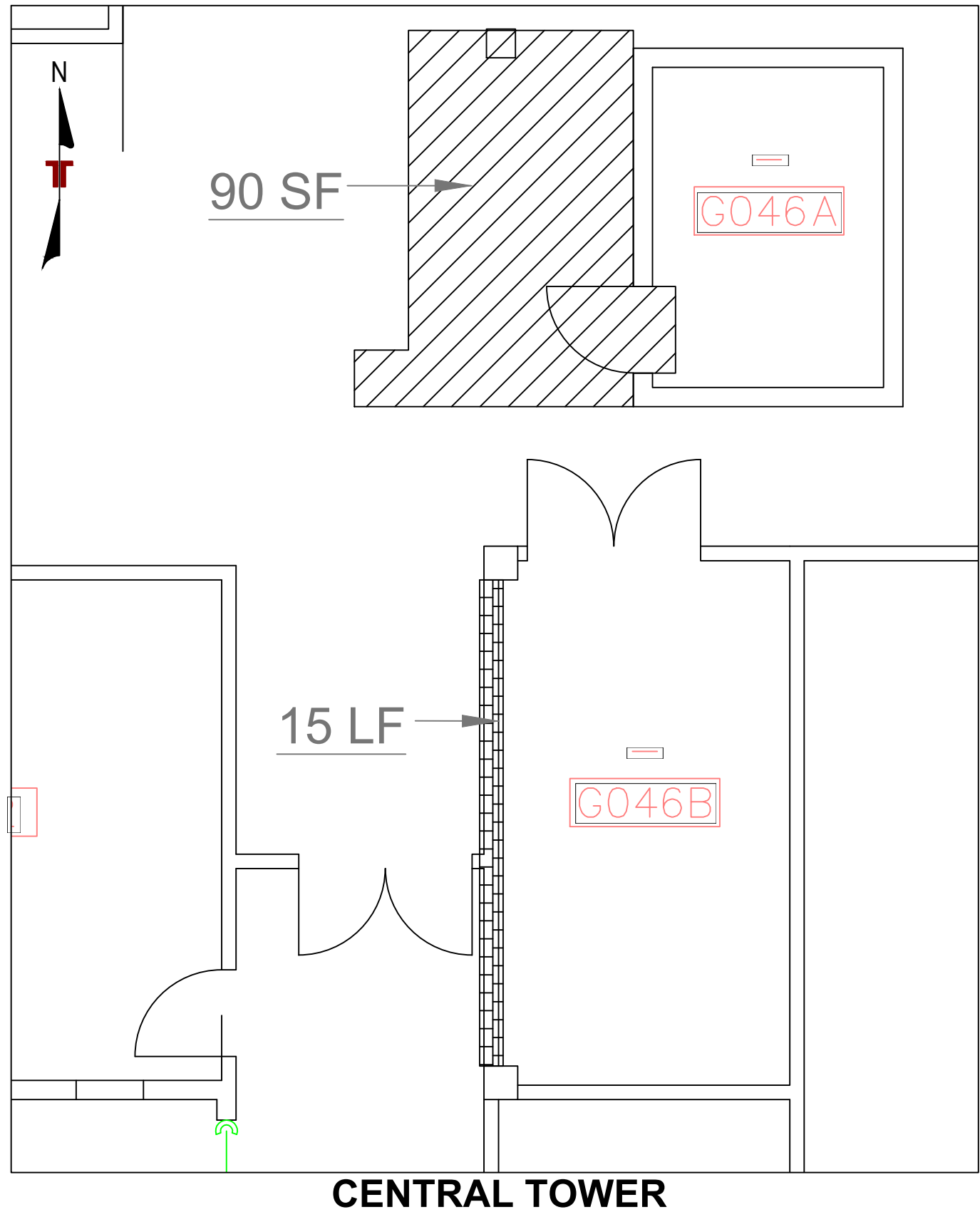
- A. Waste containers are to be temporarily stored on site pending collection and analysis of both profiling and post-remediation soil and concrete samples.
 - 1. Store Containers for all waste on-site following loading for up to ten (10) working days to facilitate waste profile sampling (if required). Storage of containers are to be properly sealed, secured, demarcated and protected from weather.
- B. The Owner (UW EH&S) and the Environmental Consultant shall determine current waste handling, transportation, and disposal regulations for the work site and for waste disposal. The Owner's Environmental Consultant in conjunction with UW protocols shall perform testing to designate the waste stream. Refer to requirements outlined under Item 1.10 Testing Limits.
- C. Contractor shall containerize Special Regulated Waste ("State Special Waste"): Waste containing >2 ppm and <50 ppm in Owner-approved, Contractor-provided and properly sealed and labeled containers is to be transported and disposed of by the Contractor at a University-approved Subtitle D landfill in accordance with all applicable local and State regulations. A list of such facilities approved by the University to accept such waste is available at: <http://www.ehs.washington.edu/epowaste/disposalfacilist.pdf>.

1. “State Special Waste” transport does not require approval/signature of shipping papers by UW EH&S prior to removal from the project site, but please notify UW EH&S prior to all shipments.
- D. Construction Debris containing PCBs (less than 2 ppm): Construction and demolition debris containing less than 2 ppm PCBs generated from the project site is to be transported and disposed of by the Contractor as “Construction Debris”. Ensure proper packaging and labeling relative to PCB content and Asbestos content as applicable. Refer to Sections 02 80 00, 02 82 00 and the HM-Series Drawings for additional information.

PART 4 - FIGURES

- 4.1 See the following figure (Figure 1) for approximate extent and location of PCB contamination in concrete and soil.

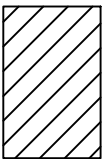
END OF SECTION



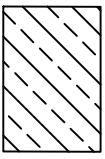
NORTH TOWER

SOUTH TOWER

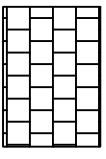
LEGEND:



REMOVE SOIL ONLY
TO 24 INCHES
BELOW SLAB



REMOVE CONCRETE
SLAB ONLY



REMOVE LOWER 12
INCHES OF CMU WALL
BLOCK ONLY

NOTES:

1. SF = SQUARE FEET
LF = LINEAR FEET
2. NOTED MATERIAL QUANTITIES ARE ESTIMATES

Project Mng:	CDK	Project No.	BA158014
Drawn By:	AAS	Scale:	NOT TO SCALE
Checked By:	CDK	File No.	*.dwg
Approved By:	MDN	Date:	December 2015

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PCB REMEDIATION LOCATIONS PLAN
North Campus Student Housing - McCarty Hall
University of Washington
Seattle, King County, Washington

FIG. No.
1